

**Watershed Restoration Action Strategy (WRAS)
And
Non Point Source Abatement Plan**

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**Upper Rio Grande Watershed Restoration Action Strategy
And
Non Point Source Abatement Plan**

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Overview of the WRAS

Background: The Upper Rio Grande Watershed is located in north central New Mexico bordering Colorado and includes several urban areas. The NM SWQB conducted TMDL studies and identified the following stream segments with water quality impairments: Rio Grande (from Red River to state border), Rio Hondo (from Rio Grande to the US forest Service boundary), Rio Fernando de Taos (from Rio Pueblo de Taos to headwaters), Rio Grande de Rancho (from Rio Pueblo de Taos to Hwy 518), and Rio Pueblo de Taos (multiple reaches).

Grazing, recreational activities, removal of riparian vegetation, and streambank modification/destabilization have influenced water quality in the relevant stream segments. Runoff from roads and/or parking lots, pollution from municipal point sources, as well as natural leaching has also affected water quality in the relevant stream segments. This combination of sources has resulted in increases in the levels of nutrients; conductivity, pH, temperature, and stream bottom deposits that exceed established water quality standards. The NM SWQB has prepared a TMDL report for the Upper Rio Grande Watershed. The Final TMDL report for the relevant stream segments was finalized in 2005.

Land uses within the watershed vary greatly and are subject to considerable change in certain areas, for instance in Taos where urban development is increasing. Land uses in rural areas include ranching and agriculture. In the Rio Hondo watershed, recreation (e.g., skiing) and related development is having an impact on water quality while in other watersheds such as the Rio Don Fernando, fire danger, grazing and riparian health are significant. In addition, as communities in the watershed grow, there is considerable potential for impacts to existing wetland resources.

Stakeholders in these areas include the various landowners, state and local governments, tribal governments, local businesses, etc. It is critical to involve all interests and affected stakeholders in implementing corrective measures to improve water quality, both in identifying specific source areas and developing a plan to implement corrective measures.

Due to the variety of land uses and the large size of the watershed, more in-depth WRASes were developed for the Rio Don Fernando de Taos, Rio Hondo and Pilar. These areas also have established neighborhood associations, active Mutual Domestic Water Associations, Acequia Associations and other nonprofit organizations that will be able to take the lead in developing projects addressing water quality issues in each specific WRAS area. Three smaller communities expressed interest in having their own WRASes developed. Though less complete, these smaller WRASes will serve as the basis for further developing their WRASes to meet their specific needs as well as appropriate to each area. These communities included: San Cristobal, Ranchos de Taos and the Greater World Community.

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Future Support for the WRAS: Taos County staff has actively participated in the development of the WRAS especially because of the direct link to the Taos Regional Water Plan. Thus far, the Steering Committee and consultant developing the plan have started to refine a number of alternatives that will meet the long-term water needs of Taos County. Importantly, one of the alternatives focuses on watershed health thus creating a direct link to the WRAS. The Steering Committee for the TRWP is also proposing to develop a “Community Board” to oversee implementation of the Regional Water Plan. If implemented, this board will have overlap to the implementation of the WRAS through the Watershed Health alternative. In Taos County, several WRAS have already been developed. This momentum and interest will poise this area for addressing water quality and quantity issues in a collaborative manner.

Priority Areas: The various watershed areas each have interested individuals and organizations willing to organize for implementation of the WRAS. For example, the Rio Don Fernando has already participated in various collaborative projects including the La Jara Collaborative, organizations in the area have received Collaborative Forest Restoration Program (CFRP) funding and through the Fire Department has developed an effective fire-wise community network. Additionally, other communities throughout the watershed have participated in collaborative processes and utilized neighborhood association networks to address quality of life issues.

Finally, the WRAS is an organic document and it is hoped that as communities learn more about issues in their area, the documents will be modified as needed in order to remain viable and useful to each community. The Bibliography in this document is extensive and will give anyone wanting to learn more about the Upper Rio Grande Watershed additional resources.

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DRAFT - July 26, 2006

Taos Canyon Watershed Site Location

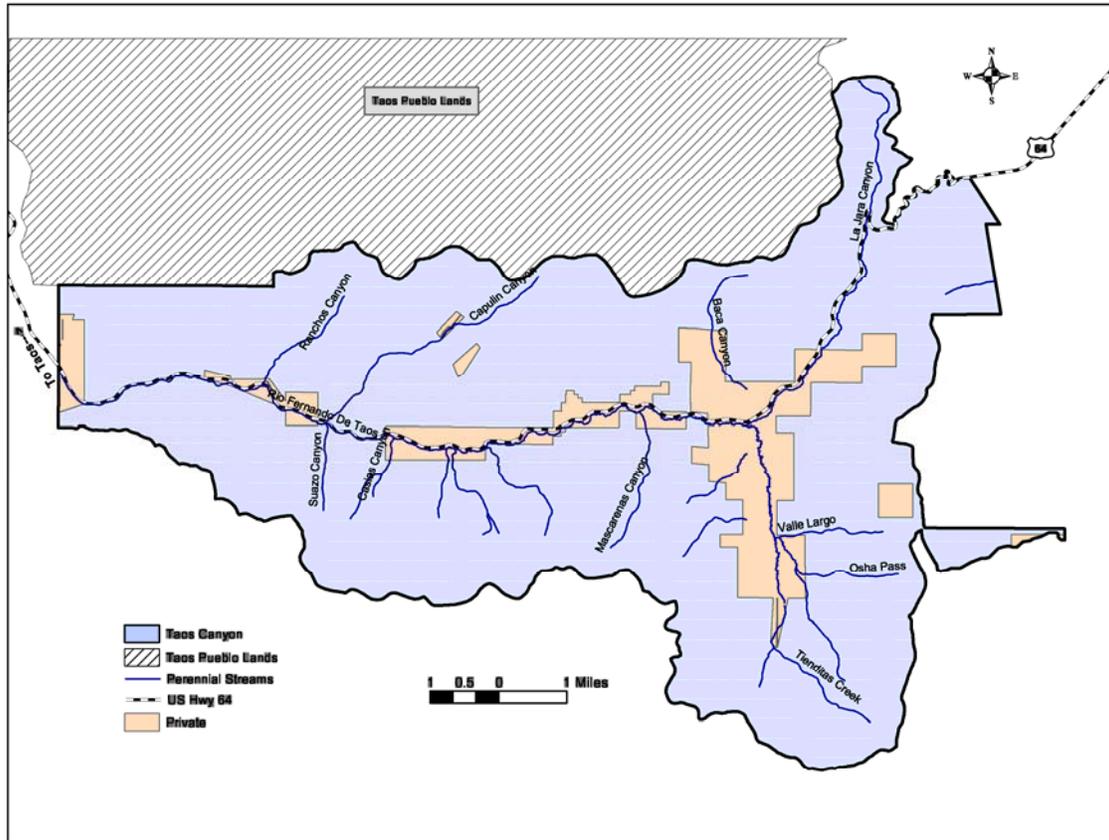


Figure 1: Taos Canyon Watershed Site Location. The map above denotes the land ownership.

I A. Introduction: What is a WRAS?

A Collaborative and Comprehensive Approach

A Watershed Restoration Action Strategy, or WRAS, is a non-regulatory, voluntary approach to addressing nonpoint source impacts to water quality. It is based not on legal obligations but on a desire to restore watershed health and water quality through the strength of collegial collaboration, open communication, and building a watershed community among local residents, agencies, and other stakeholders. It is a general blueprint for a comprehensive, watershed-wide restoration program, one small project at a time.

The 1999 New Mexico Nonpoint Source Management Program from the New Mexico Environment Department (NMED), calls for development of WRASes for those watersheds in most need of restoration. The Rio Don Fernando has long been recognized by state and federal agencies as a high priority watershed, and it lies within the Upper Rio Grande watershed which is listed as a Category 1 watershed “in need of restoration.” Category 1 watersheds receive priority funding for restoration projects, and watersheds with an existing TMDL (see below), a WRAS and/or an active watershed group receive even greater consideration. So another purpose of a WRAS is to help secure and coordinate funding for restoration projects.

This WRAS, like a community, is an evolving process. It will continue to be an organic document with the hope of remaining as fresh, useful, and relevant as possible and keeping the momentum rolling. This document represents a starting point providing a basic framework and identifying priority areas, but we will add details and layers of information as we proceed, possibly including Geographic Information System (GIS) data and maps. We hope that this document will also serve as a general watershed and resource guide for any person or entity that would like to learn more about the Rio Don Fernando watershed or address water-related issues within the watershed.

This document is a product of the Rio Don Fernando Watershed Group. The RDFWG has been working to draw together a broad-based group of watershed residents, agencies, and stakeholders to take on the immense task of restoring conditions that will improve the quality of water—and therefore the quality of life—throughout the Rio Don Fernando watershed. We address a variety of water quality issues throughout the entire drainage of the Rio Don Fernando and its tributaries—from the headwaters to the Rio Grande—through a collaborative, consensus-based approach in which every voice has equal weight.

The Rio Don Fernando Watershed Group’s mission is to restore the Rio Don Fernando to support and be safe for a variety of uses and enhance the understanding about the area waters through information and education. We pursue that mission through these four goals:

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1. Determine pollutants, their sources and effects, and communicate the information to citizens.
2. Seek opportunities to enhance fish habitat within the watershed.
3. Bring citizens together to restore, protect, and fully utilize the Rio Don Fernando.
4. Educate and inform users and citizens about the area and watershed stewardship.

Because of the regulatory history, agencies, and processes involved, there will be an unavoidable layer of technical jargon and acronyms and abbreviations in this document. We will try to make it as reader-friendly as possible with explanations, definitions, and glossaries throughout.

Clean Water Act, TMDLs, Nonpoint Source, and Point Source Pollution

The 1972 federal Clean Water Act (CWA) is the basis of most national and state water quality standards and regulations. The CWA protects water quality in all streams, lakes, and other surface waters of the U.S. It also established the goals of eliminating the discharge of all pollutants and cleaning up all surface waters to support fish, wildlife, and recreation by 1985. Thirty years later we still haven't reached those goals, but they are the intention and the ultimate aim of the regulatory processes described below and of this WRAS, all of which grew out of the CWA.

The TMDL, or Total Maximum Daily Load, is one tool that lies at the core of the WRAS, though we hope to go well beyond its limited scope in our restoration plans. As part of the federal Clean Water Act, TMDLs set limits to particular substances identified as pollutants for any given stretch of river. The New Mexico Environment Department began working on TMDL background monitoring for the Rio Don Fernando in 1999 and released a final document for the Upper Rio Grande, including the Rio Don Fernando in 2005. Only conductivity and temperature have so far been identified as limited pollutants in the TMDL, but background monitoring can provide a comprehensive picture of water quality impacts throughout the watershed.

Even for these few listed materials, the TMDL unfortunately does not include legal mechanisms for addressing “nonpoint source” impacts, which comprise up to 50% of water quality problems nationwide. Nonpoint source pollution, according to the Environmental Protection Agency (EPA), “occurs when water runs over land or through the ground, picks up pollutants, and deposits them in surface waters or introduces them into groundwater.” It comes from scattered, often indistinct sources such as abandoned mines, agricultural runoff, erosion from denuded hillsides or streambanks, fire scars, overgrazing or overcutting, parking lots, recreational or paved roads, etc. Hence the need for voluntary efforts through this watershed group, local neighborhood association and various other partners noted in the project matrix.

Point source discharges, on the other hand, are regulated by EPA under National Pollutant Discharge Elimination System (NPDES) permits and must meet TMDL limits. Point sources include any discharge that flows into a receiving body out of the end of a pipe or from a discrete source, such as runoff or seepage from an industrial site.

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In considering the TMDL and the known source impacts in the Rio Don Fernando watershed, this WRAS reflects the priorities and recommendations set forth in the 1999 New Mexico Nonpoint Source Management Program and in the 1998 Clean Water Action Plan and Unified Watershed Assessment for New Mexico.

II A. Public Outreach

Past Public Outreach Efforts

The Rio Don Fernando Watershed Group recognizes that public outreach and education are just as important to long-term nonpoint source mitigation and water quality protection as on-the-ground restoration projects. To that end, the various groups have been actively conducting outreach and education on water quality and watershed issues. Most recently, the area has collaboratively supported efforts to reduce fire danger through Forest Service sponsored projects (La Jara Collaborative) and the Neighborhood Association for fire safety. With the planning and implementation of projects outlined in this WRAS, we will continue and expand that process. Through our outreach, the Watershed Group has worked to establish credibility among a broad spectrum of watershed interests.

Key ingredients for successful public outreach include 1) clearly identifying what's in this for local residents and stakeholders, 2) keeping the process and the information clear, jargon-free, and accessible to a wide diversity of the general public, and 3) striving for maximum buy-in through relationships, projects, and solutions that are collaborative and collegial.

It is an unending process, but the Watershed Group will continue to address the public interest in terms of important issues related to water quality, including fishing, drinking water, agriculture, recreation, aesthetics, property values, and general quality of life.

Ongoing and Future Public Outreach

The Rio Don Fernando Watershed Group continues to solicit input and conduct outreach, and will expand that process through the implementation of projects outlined in this WRAS, through a variety of organizations and venues, including:

- Members of the Rio Don Fernando Watershed Group (local residents, non-profit organizations, local, state, and federal agencies, other stakeholders)
- Community constituents (acequias, foresters, ranchers, etc.)
- Outdoor interests (anglers, ATV recreationists, hikers/backpackers, cross-country, horseback riders and bicyclists)
- Local businesses
- Ongoing TMDL development under the New Mexico Environment Department (NMED)

In particular, the Watershed Group will also involve watershed residents and other stakeholders, along with land management and regulatory agencies, in the decision making process through a combination of local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups to help determine local water quality perspectives, values, and restoration priorities using sound scientific and technical expertise. We will also continue to take advantage of a variety of media and approaches

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for effective and creative public outreach and education, including oral histories, publications, and public events.

Details on coordinating cross-agency and public involvement are found in the Action Plan for this WRAS in Chapter V.



Figure 2: Rio Don Fernando de Taos Watershed

III A. Watershed Inventory and Assessment

Watershed Description

The Rio Fernando de Taos Watershed

Location and Character:

The Rio Fernando de Taos Watershed (Taos Canyon) is located in the Sangre de Cristo Mountains east of Taos, New Mexico located approximately 2 miles northwest (downstream) of the forest boundary. The boundaries of the watershed study area are US Highway 64 which bisecting watershed, Taos Pueblo private lands to the north and the old Rio Grande Grant boundary to the south.



The Rio Fernando watershed is part of the Upper Rio Grande river basin in the north central portion of Taos County, most of the watershed lays within the Carson National Forest. The watershed headwaters include two tributary streams, La Jara Canyon and Tienditas Creek, found along the ridge that separates the Rio Grande and the Canadian river basins. Other major tributaries to the Rio Fernando include Baca Canyon, Capulin Canyon, Ranchos Canyon, Shady Brook Canyon, Mondragon Canyon and Mascareñas Canyon. The comprehensive watershed is comprised of approximately 53 perennial stream miles.

There are approximately 42,486 acres (66.4 square miles) of land within the watershed, 5,130 acres (12%) are privately owned and 37,356 acres (88%) are managed by the USDA Forest Service. The private lands are principally located along the Rio Fernando riparian zone and along the Tienditas drainage. There are some private parcels located in and around large meadows and drainages. The Camino Real Ranger District of the Carson National Forest administers the National Forest System lands within the watershed.

History of Watershed Area:

For centuries the Rio Fernando has served as a resource use area and connection corridor from Taos Valley to the plains, playing a significant role in the settlement of Taos Valley. Other historic accounts suggest that perhaps Taos Canyon was used by trappers and

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traders smuggling goods in and out of Mexico. In addition, the Rio Fernando is the source of two major acequias that irrigate the lands of the Don Fernando de Taos Land Grant. These two acequias, Acequia del Sur del Canon and Acequia del Norte del Canon are over 200 years old and feed six smaller acequias from the Canyon to Taos. In the early 1900s public domain lands near Taos were reserved to be included in the Taos Forest Reserve, established in 1906. In 1848, the US-Mexican, Treaty of Guadalupe Hidalgo, declared that lands not owned by private individuals were to be included in the public domain lands. This treaty included earlier Spanish and Mexican land grants. Since 1949, there have been several land exchanges with the State of New Mexico as well as private land acquisitions to shape the Carson National Forest boundaries.

Physical Characteristics:

The Rio Fernando watershed is characterized by steep hills and canyon walls with a dendritic drainage pattern ('tree roots' branching pattern created by areas of homogenous material resulting in an uncontrolled flow direction). The surface water of the Rio Fernando flows predominantly east to west, while most tributary drainages contributing flow in a north to south direction or south to north direction, depending on which side of the main stem they may occur.

The predominant vegetation in the watershed consists of Pinon/Juniper woodlands in the lower elevations and south facing slopes, Ponderosa pine, mixed conifer forests (White fir, Douglas fir, and Ponderosa pine) and Spruce-fir forest types in the higher elevations. Broad meadows are found in the upper watershed along the La Jara and Tieditas Creeks and other tributary drainages. Deciduous woody and coniferous vegetation are found in the narrow riparian areas and steeper stream segments of the tributary drainages as well as the lower portion of the Rio Fernando. The upper watershed hosts typical wet meadow riparian vegetation including alder and willow.

Geology of Watershed Area:

The geology of the watershed area is composed primarily of interbedded sediments. Over time, as the sediments were compacted, they became the sedimentary rocks including limestone, sandstone, shale, and siltstone. These Paleozoic rocks are exposed over most of the southern part of the Sangre de Cristo Mountains due to tectonic activity and stream erosion. A close examination of these rocks commonly reveals evidence of their original environments of deposition (rivers, deltas, shorelines, tidal flats, shallow seas), including features such as ripple marks, raindrop imprints, and cross beds. The alluvial flows in the area have created valley fill, forming alluvial fans at the mouth of tributary drainages and the main stem of the Rio Fernando de Taos. These valley floors are confined by the adjoining hills and mountains. The parallel bedded strata of the arkosic sandstone, argillaceous limestone and black shales result in stable hillsides and mountain slopes that are not prone to land failure or mass wasting unless altered by undercut erosion resulting in diminished vegetation cover root strength.

Hydrology Profile:

The Rio Fernando watershed is fed primarily by snowmelt. Winters in the watershed area (November through April) are usually cold enough to sustain a snow pack above 7,000

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feet elevation. Elevations within the watershed range from approximately 7,150 feet at the Forest boundary to approximately 11,000 feet. During the summer months there are thunderstorms that are brief and intense can cause high flows and flash flooding as can rain-on-snow events in the early and late spring.

Annual precipitation ranges from 12 to 14 inches at the lowest elevations to 28 to 32 inches in the highest elevations. Approximately 50 percent of the annual precipitation occurs in the form of snowfall.

Peak flow.

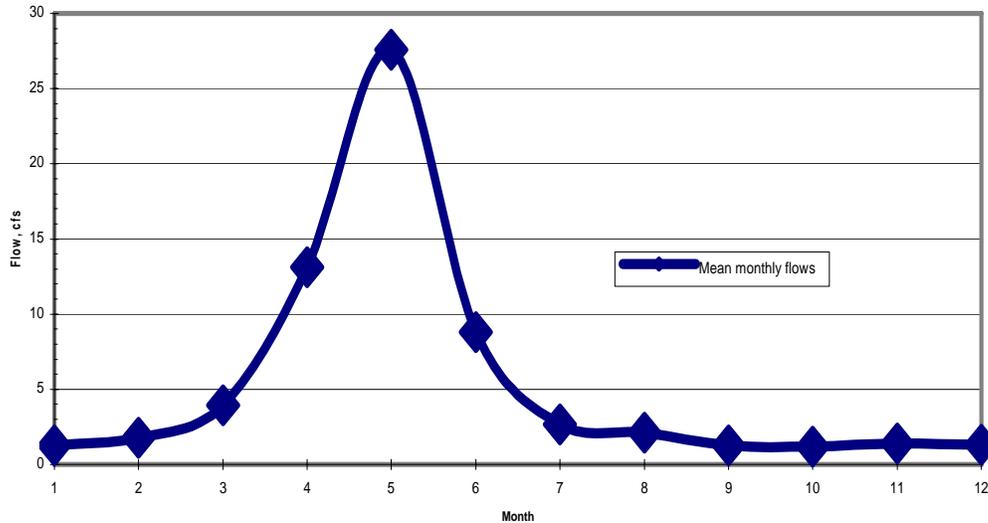
Stream discharge on the Rio Fernando de Taos was monitored continuously from the USGS gage station located near the CNF boundary (elevation of 7,140 feet). Monitoring years include 1912 to 1917, 1927 to 1928 and 1963 to 1980, the maximum peak discharge recorded during the period of record was 219 cubic feet per second on May 13, 1973. The average flow for the Rio Fernando is 5.53 cfs while low flows are about 1.19 cfs.

Review of USGS gage data for the Rio Fernando de Taos indicates the most common month for peak flows to occur is May but peak flows can occur as early as March or April and as late as August, indicating the effects of early spring snow melt and summer thunderstorm activity.

The groundwater recharge occurs in the wetland areas primarily located in the Upper watershed, there also a few Beaver Ponds down stream of the Valle Escondido turnoff. These features retain and store and slow the surface water and sediment flow allowing it to seep and infiltrate to the alluvial aquifer. Meadows along ridge tops accumulate snowmelt and rain water that also provides a source of groundwater recharge.

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Figure 2. Rio Fernando Mean Monthly Flows of Record (USGS gage 08275000), 1963-1980



WRAS Project Matrix Description

The project matrix is the core of this WRAS, providing a watershed-wide overview of 1) potential water quality issues and potential impairments, 2) potential restoration needs and projects, and 3) key stakeholders and potential partners. We recognize the fact that this table is not as detailed and exacting as it might be, but given the physical, historical, cultural, jurisdictional, and water quality complexities of this particular watershed, it is the most comprehensive water quality overview and watershed restoration blueprint to date. In some cases the table provides specific direction; at the very least it is a springboard from which to move forward to more completely identify potential water quality problems and restoration projects.

Information Needs and Sources

Watershed Issues:

Grazing in Rio Fernando Watershed:

Grazing of domestic livestock has occurred in the Taos Canyon area for over a hundred years. At the turn of the 20th century, large bands of sheep grazed in the area. However, by the 1940's a change in livestock began from sheep to cows. During the early part of the century, portions of the Taos Canyon area were administered as New Mexico State leases, and were formerly referred to as the Tienditas State Exchange lands. Many people in the Taos Valley who did not have summer range brought their cattle, horses, sheep, goats and burros to the Tienditas State lands. The USFS acquired these lands in 1950. There are now six allotments in the Taos Canyon Watershed. Grazing in these

allotments occurs between June 1 and September 30. These allotments utilize a rest rotation or deferred rotation management system. There are also several private landowners who also run cattle and horses on private land, the majority in the upper reaches around Valle Escondido.

Water Quality

Potential sources of water quality impairment are: recreation and tourism activities (US 64 is a National Scenic By-Way and the South Boundary Trail is becoming widely known as one of the most outstanding mountain bike trails in the southwestern U.S.), livestock grazing, natural sources, land development and construction, highway maintenance and runoff, bank or shoreline modification/destabilization. There were six small sawmills located in upper Taos Canyon by the 1940's. The logging was basically that of harvesting the larger trees throughout the area.

The Rio Fernando de Taos was designated a High Quality Cold Water Fishery by the NM Environment Department. However, the water quality in the watershed is significantly impaired and has resulted in higher temperatures affecting coldwater fishery habitat.

The identified sources of water quality impairment are

- ***Recreation and Tourism Activities*** (other than boating),
- ***Range Grazing*** (riparian and/or upland),
- ***Natural Sources***,
- ***Land Disposal***,
- ***Land Development***,
- ***Highway Maintenance and Runoff***,
- ***Habitat Modification*** (other than hydromodification),
- ***Construction***,
- ***Bank or Shoreline Modification/Destabilization***

The Total Maximum Daily Load (TMDL) report prepared by the State of NM Environment Department for the Upper Rio Grande Watershed includes the Rio Fernando de Taos. In order to address needed reductions for specific conductance and stream temperature Load allocations have been developed to improve water quality to attain State standards.

Monitoring data gathered of water quality indicate that the specific standards were exceeded in the lower reaches of this stream, below the forest boundary but above the confluence with the Rio Pueblo de Taos. The stream temperature is the lone parameter known to exceed State of New Mexico Water Quality Standards within the watershed area. There are currently no other State of NM water quality standards that are not being attained in the Rio Don Fernando watershed.

NMED Surface Water Quality Bureau TMDL

A TMDL is a written plan and analysis ensuring a waterbody will attain and maintain water quality standards with consideration of existing pollutants and foreseeable increases in pollutant load. (USEPA 1999). TMDLs are the compulation of the individual Waste Load Allocations (WLAs) for point source pollutants and Load

Allocations (LAs) for nonpoint sources (NPSs) with background conditions that include a margin of safety (MOS). Point source pollution is a discrete discharge of pollution through a pipe or similar transference, while nonpoint source is a non-specific source of pollution (e.g. agricultural/rangeland runoff). Current estimates indicate that nonpoint sources are the cause of approximately 95% of the state's water quality problem. The MOS accounts for uncertainty in the loading calculation. The MOS may not be the same for all waterbodies due to differences in the availability and strength of data used in the calculations. TMDLs are not regulatory documents, but they can be used to issue or modify permits for point sources. Non-point source pollution problems are addressed through non-regulatory programs including CWA [§319\(h\)](#) grants. Under [Section 303\(d\)\(1\)](#) of the [Clean Water Act](#) (CWA), states are required to develop a statewide list of water sources (rivers, streams) which violate compliance with water quality standards and establish a total maximum daily load (TMDL) for each pollutant. The NMED is the agency responsible for implementing and enforcing the regulations and development of TMDLs.

According to [40 Code of Federal Regulations \(CFR\) Part 130](#),

4 Sections of the Rio don Fernando Watershed & Suggested Projects:

I. Top of Upper Watershed (Headwaters – La Jara Canyon):

Grazing has occurred in the upper watershed since the 19th century. The Forest Service has started to address the impact of grazing on the watershed and landscape with some new management practices towards sustainable grazing. These requirements are part of the permitting process and have made some impact on the state of the upper watershed. However, there are high levels of sediment loading in the upper watershed, which have resulted in less stream flow and exceeded State standards for a High Quality Cold Water Fishery. Sediment loading has limited the aquatics and fishery habitat, resulting in fewer pools and higher temperatures.

Bank stability assessment has indicated the Rosgen B channel types in forested riparian areas were degraded and unstable. This instability in conjunction with high sediment loading reflects lost productivity, poor riparian ecology and diminished water quality. The majority of the bank instability in the upper watershed is due to cattle grazing.

Suggested Projects:

- Riparian zone fencing to protect and restore stream banks.
- Monitoring and enforcement of grazing practices on both private and public (permitted) lands.
- Willow and cottonwood planting projects.
- Streambed meandering restoration projects and monitoring
- Continue and manage forest thinning projects

II. Bottom of Upper Watershed (Mascarenas Canyon):

This region of the watershed has very dense forests, suggesting the continued need for forest thinning projects. The dense tree cover in this region inhibits the infiltration of winter snows and summer rains that don't meet the ground effectively due to the dense canopy. Historically, low heat fires used to occur every 5-15 years cleared away dry grass, shrubs, wood and small trees, creating open land for meadows and grasslands. The forests are currently too dense to hold a fire to the ground and the overstory prevents precipitation to directly reach the ground, or riparian area due to the lack of open space in the forest. These conditions exacerbate the drought conditions and increase the fire danger throughout the watershed.

Suggested Projects:

- Thinning projects that combine efforts of the Carson Forest Service, private land owners and outside organizations.
- Educational outreach to private landowners addressing the importance of forest thinning and surface water infiltration.
- Biomass recycling projects to create fuel and energy resources.

III. Top of Lower Watershed (Shady Brook Canyon):

This region of the watershed is also has very dense forests and overstory. There are currently 3 Forest Thinning projects in this area. Taos County, Colfax County and the Forest Service mitigate these projects. This area is more populated with homes (generally seasonal residents). The driveways (and stream crossings) from these homes contribute to the sediment loading for the Rio don Fernando.

Suggested Projects:

- Thinning projects that combine efforts of the Carson Forest Service, private landowners and outside organizations.
- Educational outreach to private landowners addressing the importance of forest thinning and surface water infiltration.
- Biomass recycling projects to create fuel and energy resources.
- Educational Outreach on 'Healthy Watersheds' and the importance to reduce sedimentation of the river.
- Dissemination of information on how to create proper driveway drainage to prevent erosion and sediment loading.

IV. Bottom of Lower Watershed (Ranchos Canyon to Confluence with the Rio Pueblo):

The lower watershed from Ranchos Canyon to the confluence of the Rio Pueblo suffers from the infrastructural changes in the riverbed due to urban structures including streets, bridges, gabion wall dams, material, debris and trash dumping into the river. This exacerbates erosion and sediment loading and dewater the lower watershed. All of these impacts to the Rio don Fernando continue to channelize the riverbed decreasing the ground water infiltration.

Suggested Projects:

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- An updated delineation of the floodplain of the Rio Fernando in the Urban/Wildland interface from Ranchos Canyon to the confluence with the Rio Pueblo.
- A characterization of the riparian corridor including the hydrologic and biologic factors to help prioritize areas that require reclamation, treatment and preservation.
- Monitoring storm water run off and acequia “return-flows” to prevent water quality impacts to the riparian ecosystem and the quality of the ground water it recharges.
- Erosion mitigation and bank stabilization from Ranchos Canyon to the confluence with the Rio Pueblo. River bank restoration and stabilization with willow and cotton woods.
- Monitor for nutrient loading to determine levels of septic waste contribution and grey water contribution degrading the surface water quality and the ground water quality.

Watershed Issues:

Highway Improvement: It has been proposed by the NM Highway Department to improve the Taos Canyon Road. Highway work should commence in the next few years and would be an opportunity to collaborate with the residents along the road and the NM Highway Department to improve the drainage and safety issues.

Septic Tank Contamination: Septic tanks are an issue in rural areas. Community people need to be educated about proper septic tank installation and servicing aging systems that have the potential to contaminate groundwater.

Hydrants for Fire Protection: The NRCS representative pointed out that they were part of a project to install 78 hydrants throughout the canyon. The placing of the hydrants allows the Fire Department to better address fire issues at the site rather than having to go back to the station for refill. The area is a high fire risk and additional hydrants would be helpful. In addition, another cistern could be added for fire.

Private Homes’ Driveways and stream crossing remediation: Many of the private homes on the north side of the canyon have steep driveways without proper drainage. In addition, there are stream crossings that contribute to erosion and sedimentation. Improvements to drainage of driveways are needed to prevent further erosion and silting onto the roadway.

Forest thinning: In collaboration with the Forest Service, the community could be better informed about preventing wildfires on private lands by appropriate thinning.

Recreation: ATV use in the area has been detrimental to the environment. It was noted that over 300 vehicles converge on the area at a given time. Historically, the ATVs hit the market and were quickly embraced but the public was never fully educated about

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appropriate uses of the ATVs. There is much catching up to do which may require education of children at younger ages. There are designated areas, but people often get off the designated areas and cause further erosion.

Fishing was an important part of the community and could be brought back.

Riverfront property owners affect the health of the river and should be educated about the issues and things they can do to prevent further degradation. Some private property owners are rip-rapping causing a hardening of the banks.

Utilizing Historical efforts: The Treaty of Guadalupe Hidalgo laid out a framework for how the sharing of lands would occur and appropriate areas for agriculture. Review of these documents could help to bring back methods that were used. For example, the Law of the Indies that the treaty is based on notes the size of trees to be cut. Much of this had to do with distance, but also recognition that specific trees needed to be protected.

Illegal Impoundments: It was noted that people often want to impound water for either recreational or aesthetic uses. These are illegal and the public should be educated about legal and illegal impoundments.

Grazing: There are several permittees in the area. The Ranchers have been working with the forest service to make sure there is no overgrazing. The significant number of trees in the areas affects grazing. A thinning project with the permittees would help alleviate the number of trees and open up more area for grazing.

The over-density of trees creates a closed canopy that prevents light and moisture from reaching grasses. In addition, low-level fire should be reintroduced to the area to address the over-density issues.

Roads: Often there are too many roads through the national forests. Some of these were cut for logging purposes and could now be decommissioned.

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WRAS Project Matrix

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
Watershed Wide Issue:				
Whole watershed	Temperature and conductivity throughout the watershed	Increased solar insolation of the water surface and shallow channel reaches.	<p>Cottonwood tree planting, other river/stream meandering restoration.</p> <p>Remove conifer encroachment within 261 acres of aspen</p> <p>Create 23 openings (145 Acres) some with water resources</p> <p>Develop 9 water sources (trick tanks or water lots)</p> <p>Treat 4 headcuts in La Jara Creek.</p> <p>Close and rehabilitate 6 dispersed camp sites</p> <p>Remove encroaching conifer from 521 acres of meadow edges</p> <p>Thinning in the Bul and Apache Springs areas</p>	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Quivira Coalition, other non profit organizations, private property owners

Rio Don Fernando de Taos NM WRAS

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
			<p>Protect 6/10 mile of streambank in Apache Springs by placing thinned materials to limit access by grazing animals</p> <p>Repair and reconstruct Allotment boundary and pasture division fences.</p>	
Whole watershed		Reduced undercut banks, associated with reduced water shading.	Cottonwood tree planting, other river/stream meandering restoration.	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Quivira Coalition, other non profit organizations, private property owners
Whole watershed		Filling pools with sediment, thus reducing number of pools in the stream habitat.	Erosion mitigation, sediment loading mitigation through restoration projects and regulation of other watershed threats i.e., fire, development, road maintenance.	USFS, NMED, State Forestry, NM DOT, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Quivira Coalition, other non profit organizations, private property owners
Whole watershed		Minimized effectiveness of pools as deep water areas that help to maintain cooler stream temperatures during warm seasons.	Cottonwood tree planting, other river/stream meandering restoration.	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Quivira Coalition, other non profit organizations, private

Rio Don Fernando de Taos NM WRAS

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
				property owners
Whole watershed	Temperature, conductivity, sedimentation	Reduced number of deep pools available to be used by trout as deepwater habitat during freezing periods of the winter.	River/stream meandering restoration to help recreate deep pools. Sediment loading reduction efforts.	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Quivira Coalition, Trout Unlimited, other non profit organizations, private property owners
Whole watershed	Sedimentation, erosion	Increased erosion and sediment load due to recreation activities, ATV use on fire roads and trails.	Designate recreation areas and apply enforcement, re-route where there are erosion issues, stabilize eroded areas.	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Quivira Coalition, other non profit organizations, private property owners
Whole watershed	erosion	Highway Maintenance and Runoff. Steep slope, private driveway development	Work with Taos County on moderation of salt use on roads in the winter. Channel project to feed run-off from roads away from the stream, into a leech field or wetland. Use willow buffers on private property and between highway and river.	USFS, NMED, NM DOT, Taos County, neighborhood association, private property owners
Whole watershed		Encroachment of highway and other roads and driveways in the riparian corridor.	Work with DOT and Taos County on planning Highway widening projects due to high traffic. Educate private land owners and proper engineering of	NMED, USFS, Taos County, NMDOT, Rio Don Fernando Watershed group, private land owners

Rio Don Fernando de Taos NM WRAS

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
			driveways to avoid erosion and additional sediment loading.	
Whole watershed		Reduced base and peak stream discharge caused by drought conditions and overstocked forested areas, limiting the environmental potential of the aquatic and fishery habitat.	Restoration projects, wetland and meadow restoration to increase alluvial charge and ground water resources.	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Quivira Coalition, other non profit organizations, private property owners

Upper Rio Fernando Watershed				
Upper watershed above Valle Escondido.		Grazing: There are 6 Grazing allotments in the Taos Canyon Watershed,(the Capulin, Flechado, Black Lakes, East Fernandez, Fernandez and Tienditas allotments) where grazing occurs between June 1 and September 30. There are several private landowners who also run cattle and horses on private land causing extreme impact on riparian zone resulting in sediment loading and unnecessary destruction of	Enforcement of rest rotation or deferred rotation management system. Thinning along Fletchado allotment division fences.	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Quivira Coalition, other non profit organizations, private property

Rio Don Fernando de Taos NM WRAS

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
		meadows and wetlands.		
Upper watershed		Fire Threat: Dense forest conditions and fuel loading causing high fire threat.	Forest Thinning in WUI (Wild land-Urban Interface) areas and high threat areas.	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Fire Department, other non profit organizations, private property
Upper watershed	Erosion Sedimentation	ATV use on fire roads	Enforce designated routes to mitigate non-point source pollution and erosion causing sediment loading.	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Fire Department, other non profit organizations, private property
Upper watershed		Dense forest conditions and limited management	Continue thinning projects. Three large thinning projects in the watershed, South Shady Brook (85% complete), North Shady Brook (yet to begin) and La Jara (30-40% complete).	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Fire Department, other non profit organizations, private property
Upper watershed	Fecal choliform	Septic Tank Pollution: Some systems are in violation of regulations. Regulations include: 100 feet of distance between discharge point and the river. Trench of a minimum of 1 foot with 4 feet of top soil from point of discharge	More community education on how to properly care for a septic waste system. Propose and promote “living systems” solutions to sewage waste that are environmentally friendly.	NMED, EPA, Rio Don Fernando Watershed Group, other non profit organizations, private land owners

Rio Don Fernando de Taos NM WRAS

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
		to the high water line and a minimum of 6 feet distance to the water table.		
Upper watershed		Habitat Modification (other than hydro-modification)	Restore meadows and wetlands where severely impacted	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Quivira Coalition, other non profit organizations, private property owners
Upper watershed		Illegal Water Impoundments: Some private landowners are impounding water for recreational or aesthetic uses.	Educate the public about what is legal use of surface water on their property or on public lands.	USFS, NMED, SEO, Rio Don Fernando Watershed Group, Taos SWCD, Taos County, private property owners
Some upper and some lower watershed.		Land Development/ Construction: Increased development of private lands that is poorly regulated.	Work with county on private land sales and recommendations for planning and zoning to mitigate impact of new development.	Taos County, NMED, Rio Don Fernando Watershed Group, Taos SWCD, private property owners

Lower Rio Fernando Watershed				
Lower watershed		Urban/Wildland Interface: -Erosion and non point source pollution issues	-An updated delineation of the floodplain of the Rio Fernando in the Urban/Wildland interface from Ranchos Canyon to the	USFS, NMED, State Forestry, Rio Don Fernando Watershed group, Taos SWCD, Taos County, other non profit organizations,

Rio Don Fernando de Taos NM WRAS

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
			<p>confluence with the Rio Pueblo.</p> <p>-Monitoring storm water run off and acequia “return-flows” to prevent water quality impacts to the riparian ecosystem and the quality of the ground water it recharges.</p>	<p>Acequia Associations, private property owners</p>
Lower watershed		Stream-bank or Shoreline Modification/Destabilization	<p>-A characterization of the riparian corridor including the hydrologic and biologic factors to help prioritize areas that require reclamation, treatment and preservation.</p> <p>-Bank stabilization project with willows and cotton woods. Regulate recreation and grazing to minimize impact on stream banks.</p>	<p>USFS, NMED, Rio Don Fernando Watershed group, Taos SWCD, Taos County, other non profit organizations, Acequia Associations, private property owners</p>
Lower watershed		Water tank at the mouth of the canyon is on a mutual-domestic well which pumps from the Rio Fernando water table. The quality of that water is assumed to be poor due to point source	Surface and ground water quality monitoring projects to determine level of water quality.	<p>NMED, EPA, Local MDWAs, Rio Don Fernando Watershed Group</p>

Rio Don Fernando de Taos NM WRAS

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
		and non-point source pollutions throughout the watershed.		
Lower watershed		Extreme channelization and welding of stream bottom of waterway near the Don Fernando bridge in Town of Taos, is destroying the habitat and fish ecology if river.	Restoration projects to re-establish the riparian habitat in the lower watershed to improve water quality for acequia use and recreate a living stream.	USFS, NMED, Rio Don Fernando Watershed group, Taos SWCD, Taos County, Town of Taos, non profit organizations, Acequia Associations, private property owners
Lower watershed		Improper use of acequia system: Grey water lines pumping into acequia	<p>-Monitor for nutrient loading to determine levels of septic waste contribution and grey water contribution degrading the surface water quality and the ground water quality</p> <p>-Education of water quality issues due to pollution in “public” water ways. Downstream user issues.</p>	NMED, EPA, Rio Don Fernando Watershed Group, Taos County, Acequia Associations, private property owners

IV A. Water Quality Goals

Desired Conditions and Uses

One priority water quality goal is to implement the proposed TMDLs for the Rio Don Fernando and its tributaries in as far as we are able throughout the watershed.

As the WRAS continues to evolve through an iterative, adaptive process, Watershed Group partners and working groups will determine specific desired uses and the conditions required to reach those uses for each subwatershed and/or on a project-by-project basis. This process will involve the land management and regulatory agencies, but will also involve watershed residents and other stakeholder through an extensive outreach program. To help determine desired uses and conditions we will solicit local perspectives, values, and priorities through local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups. The scoping, designing, and implementation of projects will obviously incorporate all available information and will also utilize the best science available.

Monitoring and Assessments

To measure whether we have attained the desired uses and conditions, it will be important to establish clear water quality goals and monitoring protocols for each restoration project. Along with conventional quantitative water quality measurements, in places we will also utilize the Rosgen Stream Classification System for general assessments of stream health and fishery habitat, as well as other qualitative ecological assessments as appropriate.

Whenever possible, we will utilize all available regulatory-related water quality monitoring data, both as existing baseline data and to monitor ongoing progress. Some of the baseline data will come from the final TMDL background monitoring and other previous water quality studies and reports. However, all up-to-date and available data will be utilized. Particular projects may be able to piggyback on the monitoring and data from the ongoing USGS Background Characterization Study. In addition to existing partners, we may find need to hire professional consultants to help design and implement water quality monitoring and other assessments.

Water quality monitoring and other assessments, before, during, and after each project, can double as an excellent opportunity for hands-on education. This approach opens many opportunities for expanded outreach, solicits in-kind contributions to help get the work done, and provides solid experiential education for the participants.

Project and Process Evaluation

In addition to physical monitoring and assessments, it is just as important to monitor and evaluate the process of communication, collaborative planning, and project implementation on an ongoing basis. The Watershed Group will actively solicit and

incorporate recommendations and input from all project partners and local residents early in the planning process. During and after every project, we will actively solicit and incorporate follow-up recommendations and input as part of an iterative adaptive management process. This is important for better project implementation, but also for improving communications, strengthening collaborative partnerships, and working toward building a broad and strong watershed-wide community.

V A. Action Plan

Still a Collaborative and Comprehensive Approach

A WRAS, by definition and intent, is a comprehensive approach that includes technical, educational, and financial components of watershed restoration. A Watershed Group may not take the lead on every project, but a main function will be to coordinate all the relevant stakeholders, information, technical resources, public educational activities, and finances for watershed restoration projects. With all projects, the Watershed Group will help coordinate compliance with all laws, regulations, and permits, particularly the legal requirements of NEPA and other federal laws for any actions on federal lands. This coordinated approach will help facilitate communication, networking, and planning among the many agency and private stakeholders, even beyond the scope of the WRAS, and will help avoid duplication of efforts.

The project matrix in Chapter III includes a preliminary list of key stakeholders and potential partners for each potential project area. As part of the project coordination, the Watershed Group will continue to identify and involve core stakeholders for each water quality issue or restoration project, incorporating existing mandates and agreements between agencies and other entities as much as possible. As with monitoring and assessments, involving and coordinating local schools and educational and non-profit conservation organizations in restoration projects will be an integral part of our effort. Again, it is an excellent opportunity to both enlist volunteers and facilitate hands-on watershed and natural resource education.

The Watershed Group will always keep in mind the fact that this WRAS is a non-regulatory, voluntary approach based not on legal obligations but on the strength of collegial collaboration, open communication, and building a watershed community. It is important for us to keep that spirit in all our restoration planning and projects. Without a formal legal framework, however, we will structure strategic partnerships and stipulate expectations between agencies and other stakeholders through formal Memoranda of Understanding (MOUs) or Memoranda of Agreement (MOAs) to insure better follow through on restoration plans and projects. Some general MOUs and MOAs already exist between federal and state agencies.

Priorities and Timetable

Looking at the general list of water quality issues and potential problems and the potential restoration needs and projects in the project matrix in Chapter III, it is obvious

that there is no shortages of restoration work in this watershed. The trick will be to strategically prioritize the projects in a way that makes sense and is achievable. We will use several criteria for determining priorities and structuring projects:

- *Consistency with existing management plans.* This might include, for instance, USFS forest thinning projects, erosion mitigation projects, grazing program modifications, or a recreation travel plan. The Taos County Comprehensive Plan calls for such things as better land use planning, protecting local water and land, preserving open space, and developing economic opportunities, all of which could well be consistent with restoration projects.
- *Fit within existing MOUs and MOAs.* Several state and federal agencies already have formal agreements and relationships through MOUs and MOAs that deal with particular issues.
- *Reflect local community concerns and priorities*
- *Potential as experimental pilot projects to test the feasibility of certain treatments.* Before taking on a larger project with uncertain results, we will test certain treatments on a smaller scale first.
- *Potential as demonstration pilot projects to generate public interest, involvement, and support.*
- *Potential for building or strengthening partnerships.* Along the lines of the previous item, building and strengthening relationships among watershed residents and stakeholders is a high priority to keep the WRAS process moving forward.
- *Availability of funding.* All projects will of course be contingent on funding.

The project matrix in Chapter III outlines water quality issues and potential restoration projects on a site-by-site basis. In general, the Watershed Group will address identified quality issues (from the list under “Water Quality Problems” in Chapter III) in the following ways:

- *Unnaturally dense forest conditions and excessive fuel loading in spruce-fir and mixed conifer areas from historical fire and forestry management practices.* Work with the USFS and local residents to develop local expertise in thinning and prescribed fire programs through the Collaborative Forest Restoration Program (CFRP) and the Wildland-Urban Interface fire program. This will also create significant opportunities for local capacity building and sustainable, small-scale economic development.
- *Sediment and nutrient contamination from excessive livestock and wildlife grazing.* Conduct impact assessment and mitigation, including the USFS’s ongoing implementation of rest-rotation grazing management and erosions control.
- *Nutrient contamination from poorly designed and poorly regulated septic systems in the valley floodplain.* Continue the process of citizen monitoring, public education, and regulatory enforcement of Taos County and NMED regulations.
- *Wetlands, riparian, and stream impacts from dense and poorly regulated development in the upper valley.* Continue the process of public education, citizen monitoring, and regulatory enforcement of U.S. Army Corps of Engineers permits and regulations.

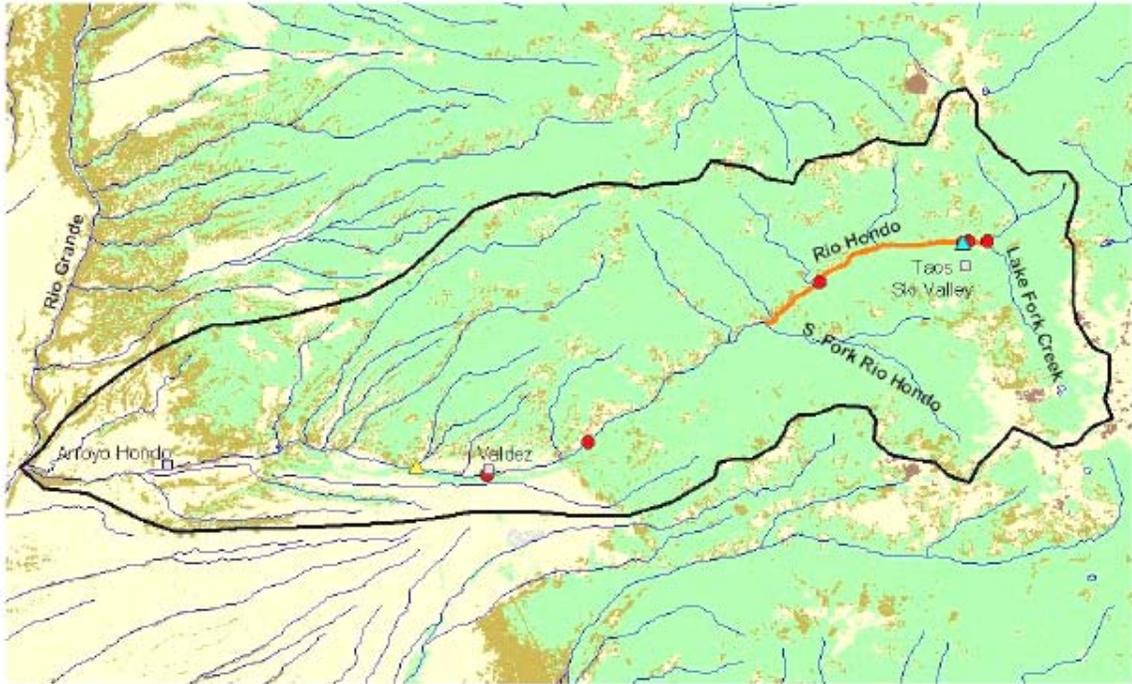
- *Sediment erosion from excessive ATV use and poorly designed and maintained recreational roads.* Building upon the ongoing USFS recreational road inventory and assessment, prepare a comprehensive recreational travel plan with all stakeholders, possibly including volunteer road closures, reroutes, culvert projects, and roadbed and erosion stabilization.
- *Erosion from unnaturally dense ponderosa and piñon-juniper woodlands where grasses and groundcover are crowded out.* Work with the USFS and local residents to develop local expertise in thinning and prescribed fire programs through the CFRP and the Wildland-Urban Interface fire program, and reseed native grasses. This will also create opportunities for small-scale fuelwood enterprises.
- *Sediment erosion from road cuts and other paved roads.* Working with the New Mexico State Highway & Transportation Department and NMED, conduct an impact assessment and design mitigation projects.
- *Habitat loss due to degraded and unnaturally channelized stream course.* Conduct stream morphology assessments and enhancements based on Dave Rosgen's Stream Classification System.

**Rio Hondo NM WRAS
Water Restoration Action Strategy
&
Non Point Source Abatement Plan**



DRAFT July 22, 2006

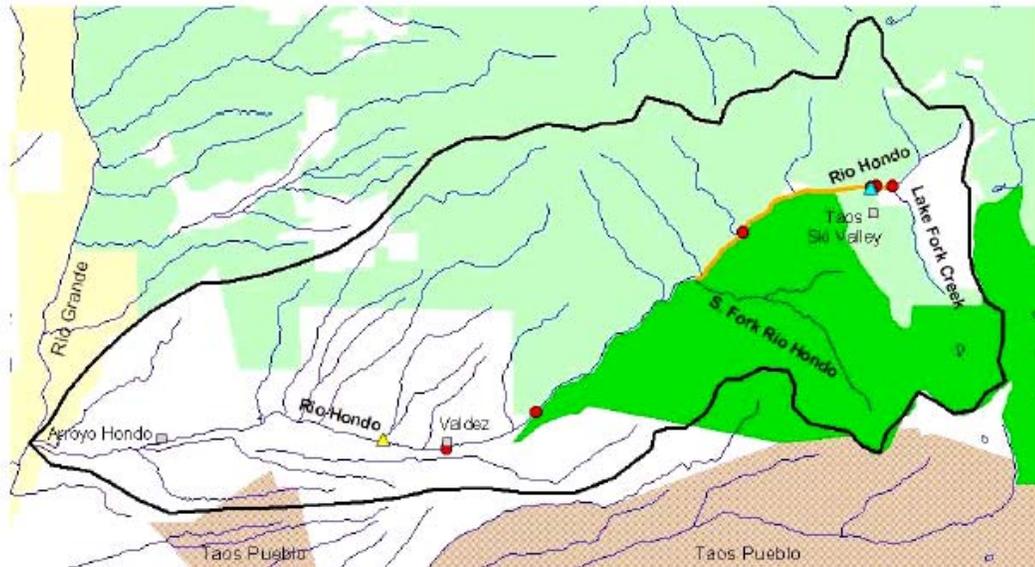
Rio Hondo Watershed Land Use/Cover



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Figure 3: Rio Hondo Watershed Map

Rio Hondo Watershed Land Ownership



- ▲ Twining WWTP
- Sampling Stations
- ▲ USGS Gage
- TMDL Reaches
- Watershed Boundary
- Wilderness
- Forest Service
- Wilderness
- Tribal
- Private
- BLM



Source Data
BLM Land Status 2004
NHD hydrography



Map 2 (from New Mexico Environment Department *Final Approved Total Maximum Daily Load (TMDL) for the Rio Hondo (South Fork of Rio Hondo to Lake Fork Creek)*, June 14, 2005).

I B. Introduction: What is a WRAS?

A Collaborative and Comprehensive Approach

A Watershed Restoration Action Strategy, or WRAS, is a non-regulatory, voluntary approach to addressing non-point source impacts to water quality. It is based not on legal obligations but on a desire to restore watershed health and water quality through the strength of collegial collaboration, open communication, and building a watershed community among local residents, agencies, and other stakeholders. It is a general blueprint for a comprehensive, watershed-wide restoration program, one small project at a time.

The 1999 New Mexico Non-point Source Management Program from the New Mexico Environment Department (NMED) calls for development of WRASes for those watersheds in most need of restoration. The Rio Hondo has long been recognized by state and federal agencies as a high priority watershed, and it lies within the Upper Rio Grande watershed which is listed as a Category 1 watershed “in need of restoration.” Category 1 watersheds receive priority funding for restoration projects, and watersheds with an existing TMDL (see below), a WRAS and/or an active watershed group receive even greater consideration. So another purpose of a WRAS is to help secure and coordinate funding for restoration projects.

This WRAS, like a community, is an evolving process. It will continue to be an organic document with the hope of remaining as fresh, useful, and relevant as possible and keeping the momentum rolling. This document represents a starting point providing a basic framework and identifying priority areas, but we will add details and layers of information as we proceed, possibly including Geographic Information System (GIS) data and maps. We hope that this document will also serve as a general watershed and resource guide for any person or entity who would like to learn more about the Rio Hondo watershed or address water-related issues within the watershed.

This document is a product of the Rio Hondo Watershed Group. The RHWG has been working to draw together a broad-based group of watershed residents, agencies, and stakeholders to take on the immense task of restoring conditions that will improve the quality of water—and therefore the quality of life—throughout the Rio Hondo watershed. We address a variety of water quality issues throughout the entire drainage of the Rio Hondo and its tributaries—from the headwaters to the Río Grande—through a collaborative, consensus-based approach in which every voice has equal weight.

The Rio Hondo Watershed Group’s mission is to restore the Rio Hondo to support and be safe for a variety of uses and enhance the understanding about the area waters through information and education. We pursue that mission through these four goals:

1. Determine pollutants, their sources and effects, and communicate the information to citizens.
2. Seek opportunities to enhance fish habitat within the watershed.

3. Bring citizens together to restore, protect, and fully utilize the Rio Hondo.
4. Educate and inform users and citizens about the area and watershed stewardship.

Because of the regulatory history, agencies, and processes involved, there will be an unavoidable layer of technical jargon and acronyms and abbreviations in this document. We will try to make it as reader-friendly as possible with explanations, definitions, and glossaries throughout.

Clean Water Act, TMDLs, Nonpoint Source, and Point Source Pollution

The 1972 federal Clean Water Act (CWA) is the basis of most national and state water quality standards and regulations. The CWA protects water quality in all streams, lakes, and other surface waters of the U.S. It also established the goals of eliminating the discharge of all pollutants and cleaning up all surface waters to support fish, wildlife, and recreation by 1985. Thirty years later we still haven't reached those goals, but they are the intention and the ultimate aim of the regulatory processes described below and of this WRAS, all of which grew out of the CWA.

The TMDL, or Total Maximum Daily Load, is one tool that lies at the core of the WRAS, though we hope to go well beyond its limited scope in our restoration plans. As part of the federal Clean Water Act, TMDLs set limits to particular substances identified as pollutants for any given stretch of river. The New Mexico Environment Department began working on TMDL background monitoring for the Rio Hondo in 1999 and released a final document in 2005. Only water temperature has been identified as a TMDL water quality impairment from the USFS boundary to the Rio Grande, stream bottom deposits, and turbidity have so far been identified as limited pollutants in the draft TMDL, but the background monitoring can provide a comprehensive picture of water quality impacts throughout the watershed.

Even for these few listed materials, the TMDL unfortunately does not include legal mechanisms for addressing "non-point source" impacts, which comprise up to 50% of water quality problems nationwide. Non-point source pollution, according to the Environmental Protection Agency (EPA), "occurs when water runs over land or through the ground, picks up pollutants, and deposits them in surface waters or introduces them into groundwater." It comes from scattered, often indistinct sources such as abandoned mines, agricultural runoff, erosion from denuded hillsides or streambanks, fires scars, overgrazing or overcutting, parking lots, recreational or paved roads, etc. The need for a voluntary watershed group and this WRAS are in important aspect of addressing watershed health.

Point source discharges, on the other hand, are regulated by EPA under National Pollutant Discharge Elimination System (NPDES) permits and must meet TMDL limits. Point sources include any discharge that flows into a receiving body out of the end of a pipe or from a discrete source, such as runoff or seepage from an industrial site.

In considering the TMDL and the known source impacts in the Rio Hondo watershed, this WRAS reflects the priorities and recommendations set forth in the 1999 New Mexico

Nonpoint Source Management Program and in the 1998 Clean Water Action Plan and Unified Watershed Assessment for New Mexico.



Figure 1: Hondo/Valdez

II B. Public Outreach

Past Public Outreach Efforts

The Rio Hondo Watershed Group recognizes that public outreach and education are just as important to long-term non-point source mitigation and water quality protection as on-the-ground restoration projects. With the planning and implementation of projects outlined in this WRAS, we will continue and expand that process. Through our outreach, the Watershed Group has worked to establish credibility among a broad spectrum of watershed interests and develop our role as an open forum, reliable information clearinghouse, and source of unbiased watershed information.

Key ingredients for successful public outreach include 1) clearly identifying what's in this for local residents and stakeholders, 2) keeping the process and the information clear, jargon-free, and accessible to a wide diversity of the general public, and 3) striving for maximum buy-in through relationships, projects, and solutions that are collaborative and collegial.

It is an unending process, but the Watershed Group will continue to address the public interest in terms of important issues related to water quality, including fishing, drinking water, agriculture, recreation, aesthetics, property values, and general quality of life.

Ongoing and Future Public Outreach

The Rio Hondo Watershed Group continues to solicit input and conduct outreach, and will expand that process through the implementation of projects outlined in this WRAS, through a variety of organizations and venues, including:

- Members of the Rio Hondo Watershed Group (local residents, non-profit organizations, local, state, and federal agencies, other stakeholders)
- Community constituents
- Outdoor interests
- Local businesses
- Ongoing TMDL development under the New Mexico Environment Department (NMED)

In particular, the Watershed Group will also involve watershed residents and other stakeholders, along with land management and regulatory agencies, in the decision making process through a combination of local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups to help determine local water quality perspectives, values, and restoration priorities using sound scientific and technical expertise. We will also continue to take advantage of a variety of media and approaches for effective and creative public outreach and education, including oral histories, publications, and public events.

Details on coordinating cross-agency and public involvement are found in the Action Plan for this WRAS in Chapter V.



Figure 2: Rio Hondo



Figure 3: Hondo Arroyo Seco

III B. Watershed Inventory and Assessment

Rio Hondo Watershed

(Note: Much of the information for the Rio Hondo watershed was adapted or taken directly from the New Mexico Environment Department *Final Approved Total Maximum Daily Load (TMDL) for the Rio Hondo (South Fork of Rio Hondo to Lake Fork Creek), June 14, 2005* and the New Mexico Environment Department *Total Maximum Daily Load (TMDL) for the Upper Rio Grande Watershed (Part 1) Pilar, NM to Colorado Border, November 9, 2004*.)

Watershed Description

From the top of the watershed at 13,161 feet of elevation in the Sangre de Cristo Mountains to its confluence with the Rio Grande at 5,500 feet, the Rio Hondo drains an area of roughly 72 square miles. After gathering runoff from high peaks and ridges into a single stream at about 9,300 feet of elevation, the Rio Hondo flows from the Taos Ski Valley for eight miles in a narrow, steep-sided canyon until it reaches the U.S. Forest Service (USFS) boundary at 7,650 feet. The Rio Hondo then flows for nine more miles through a broad, sloping piedmont valley and into a narrow gorge near the bottom and enters the Rio Grande as a major perennial tributary at the John Dunn Bridge. The annual average discharge of the Rio Hondo at the USGS gaging station just below the village of Valdez is 35.4 cubic feet per second.

The uppermost reaches of the watershed along the high ridges, including Wheeler Peak, the highest point in New Mexico, are alpine tundra. Aspen, spruce, and fir forests comprise most of the groundcover from Taos Ski Valley down to the USFS boundary. The lower piedmont valley is primarily agricultural, surrounded by sage and chamisa shrublands on the lower mesas and piñon-juniper woodlands on higher slopes. Environment in the watershed includes 78% forest, 10% grassland/tundra, 7% shrubland, 3% urban development, and 2% barren land (see Map 1). Land ownership is 61% USFS, 38% private, and 1% tribal land (see Map 2).

The geology of the Rio Hondo watershed consists of a complex distribution of Precambrian igneous and metamorphic rocks, Pennsylvanian sedimentary rocks, Tertiary intrusives. The lower portions of the watershed also contain Quaternary deposits including volcanics and various alluvial materials. The Rio Hondo bisects two distinct geologic areas. The area east of Valdez consists mainly of Precambrian metamorphic (schist, gneiss, quartzite) and igneous rocks (granite, andesite, porphyry). This area may also contain small deposits of Pennsylvanian sedimentary rocks including arkosic shales, sandstones and conglomerates. The area west of Valdez consists mainly of Quaternary alluvial materials (including stream, fan, and glacial deposits) and basalt flows interbedded with sands and gravels, which were deposited during periods of erosion between volcanic events.

Land use in the upper and middle reaches on mostly USFS lands includes primarily recreational activities, including skiing, hiking, mountain biking, and fishing, as well as livestock grazing by USFS permittees and the dense development at Taos Ski Valley resort. State Highway 150 runs alongside the Rio Hondo through the upper and middle watershed. The lower watershed, which is largely private land, includes rural villages, irrigated agriculture, single-family housing development, and some fishing. Primary public roads in the lower watershed include State Highway 230 through Valdez and County Roads B-143 and B-005 through Arroyo Hondo.

Sub-watershed Zones

From the top down, the watershed has been administratively divided into three subwatershed zones, each with distinctive topography and vegetation, land use, and jurisdictions:

Upper Watershed (Headwaters to South Fork Rio Hondo, including Lake Fork Creek to South Fork Rio Hondo—NM-2120.A_43)

The headwaters drainage area and 3.88 miles of river between Lake Fork Creek and the South Fork Rio Hondo comprise the Upper Rio Hondo watershed, encompassing 21 square miles of forested land, including part of the 1742 Antoine Leroux Land Grant (now USFS with some private land). The upper watershed is 90% undeveloped, including the Wheeler Peak Wilderness Area and Columbine-Hondo Wilderness Study Area, but Taos Ski Valley is the most densely developed area in the watershed, designated by the New Mexico Environment Department (NMED) as “urban.” The upper watershed also includes a number of abandoned mines. The Rio Hondo through this reach provides essential habitat for a variety of terrestrial and aquatic organisms.

Middle Watershed (South Fork Rio Hondo to USFS Boundary—NM-2120.A_602)

The Middle Rio Hondo watershed includes 4.43 miles of the stream from the South Fork Rio Hondo to the USFS boundary at the mouth of the canyon immediately above the village of Valdez. The middle watershed drains an area of about 15 square miles of primarily forested USFS land, including portions of Antoine Leroux Land Grant, the Wheeler Peak Wilderness Area, and the Columbine-Hondo Wilderness Study Area. The Rio Hondo through this reach provides essential habitat for a variety of terrestrial and aquatic organisms.

Lower Watershed (USFS Boundary to Rio Grande—NM-2120.A_600)

The Rio Hondo from the USFS boundary to the Rio Grande to is 8.5 miles, draining an area of about 36 square miles, exactly half of the entire watershed area. The lower watershed includes part of the Taos Pueblo Tract B Grant, the 1716 Antonio Martinez or Lucero de Godoi Land Grant, and the 1815 Arroyo Hondo Land Grant. Today it is primarily private land with a sliver of Bureau of Land Management land near the bottom along the Rio Grande Gorge. The agricultural villages of Valdez and Arroyo Hondo and numerous active *acequias* lie along the valley bottom, with single-family housing and some condominium development on the upper shrubland mesas and piñon-juniper woodland slopes.

WRAS Project Matrix Description

The project matrix is the core of this WRAS, providing a watershed-wide overview of 1) potential water quality issues and potential impairments, 2) potential restoration needs and projects, and 3) key stakeholders and potential partners. We recognize the fact that this table is not as detailed and exacting as it might be, but given the physical, historical, cultural, jurisdictional, and water quality complexities of this particular watershed, it is the most comprehensive water quality overview and watershed restoration blueprint to date. In some cases the table provides specific direction; at the very least it is a springboard from which to move forward to more completely identify potential water quality problems and restoration projects.

Information Needs and Sources

In the spirit of approaching this WRAS as a living, working document, the Rio Hondo Watershed Group and its partners will continue to build on the overview presented in the table with additional layers of information and detail as we move forward with specific restoration projects. Some of the information we will continue to gather and add to the WRAS process includes:

- Additional maps, possibly including layered GIS maps
- Specifics on soils and vegetation
- Hydrogeology data
- More detail on surface water quality concerns
- Stream morphology assessments
- Abandoned mine inventory and assessment
- Inventory and assessment of U.S. Forest Service (USFS) and recreational roads
- Specific data on state highway impacts
- Details on jurisdiction, ownership, and land use
- Historical uses, traditional values, local knowledge
- Recognition of rapid changes in uses of land and water
- Recognition of regulation changes

Potential sources for this information include:

- Ongoing USFS inventory and assessment of national forest and recreational roads
- NMED TMDL background monitoring data and other studies
- New Mexico Office of the Natural Resources Trustee
- U.S. Geological Survey (USGS) Background Characterization Study
- U.S. Fish & Wildlife Service (USFWS) studies
- New Mexico Department of Fish & Game (NMDGF) studies
- New Mexico State Highway & Transportation Department (NMSHTD) information
- Taos County Planning Department
- New Mexico State Historical Archives

- Amigos Bravos library
- Personal libraries and archives of watershed residents
- Oral histories and local knowledge

Water Quality Problems

Upper Watershed

The upper watershed has a Total Maximum Daily Load (TMDL) for nutrients. Though there is a history of nutrient contamination from the Taos Ski Valley (TSV) wastewater treatment plant at Twining, the TMDL document states: “This assessment unit is **not** listed as an impaired reach in the *2004-2006 State of New Mexico Integrated Clean Water Act 303(d)/ 305(b) Report*. This TMDL document was written as a precautionary measure to help mitigate the expansion of the Village of Taos Ski Valley’s Wastewater Treatment Plant and to prevent or reduce the probability of any future nutrient impairment.”

The TSV wastewater treatment plant at Twining is the only “point source” discharge into the Rio Hondo. Whether or not it affects water quality, it is already regulated under a National Pollutant Discharge Elimination System (NPDES) permit and it is not necessary to address it in this WRAS, which is intended to address “nonpoint sources” of impairment to water quality. There continues to be significant concern from downstream communities in the watershed about past and potential impacts from the wastewater treatment plant, so the following brief discussion is included as general history and background.

During the 1970s, the Twining Water and Sanitation District (which held the NPDES permit before TSV) regularly violated effluent limits under its NPDES permit, causing violations of water quality standards and damage to the aquatic habitat within the Rio Hondo. In 1979, responding to pressure from the Committee to Save the Rio Hondo and downstream residents, NMED (known then as the Environmental Improvement Division (EID)) became more stringent in enforcement of the state’s Water Quality Control Commission regulations. Between 1979 and 1981 EID documented water quality and established background conditions in the Rio Hondo, and a TMDL to limit pollution by nutrients was completed for the upper watershed in 1981. As a result of the monitoring efforts and TMDL during this time, EID developed a revised NPDES permit (NM0022101) that defined effluent limitations such that the discharge from the Twining plant would not cause violations of the water quality standards protecting the Rio Hondo. In conjunction with NM0022101, new management took over plant operations in the late 1980s, which resulted in improvements to effluent over time. Reports since 1993 indicate that all plant operations, maintenance, and effluents are meeting current NPDES permit requirements.

The NPDES permit, designed for capacity of 100,000 gallons per day (or 0.1 million gallons per day (MGD)) expired in November 2005. The Village of Taos Ski Valley, current holder of the NPDES permit, applied for a new permit to increase the amount of effluent discharged into the stream. The proposed project would double the wastewater

effluent to about 200,000 (or 0.2 MGD) averaged over a seven-day period during peak winter season. The Surface Water Quality Bureau (SWQB) of NMED implemented a special study in 2004 to prepare for a revision of the TMDL for nutrients.

As mentioned above, the wastewater treatment plant at Twining in the upper watershed is the only point source discharge into the Rio Hondo. Other “nonpoint,” or dispersed, sources of nutrients include the residential and urban areas of Taos Ski Valley, septic tank disposal systems, construction sites, recreational activities, ski slope runoff, and atmospheric deposition. Nutrients enter the stream by way of overland surface runoff during spring snowmelt and storm events, through groundwater that contains elevated levels of nutrients from septic tank wastewater, via atmospheric deposition (i.e. dust), and from background, or natural, sources. Sediment runoff from steep trails constructed near streams may also be having an impact.

Middle Watershed

There are no current documented impairments in the middle watershed, however, based on past experience, some residents in the lower watershed remain concerned about nutrient contamination from the Taos Ski Valley, or potential contamination from increased development and increased effluent from the wastewater treatment plant. Other potential nonpoint sources of impairment include sediment runoff from gravel parking areas at the two campgrounds in the middle watershed, at dispersed camping areas, at trailheads, and at popular fishing spots. Residents also express concern about potential severe impairments that could be caused from forest fires, particularly during the current period of a drying climate.

Lower Watershed

The lower watershed is currently impaired by and TMDL listed for temperature. This impairment affects the designated use as a high quality coldwater fishery. The probable sources of temperature impairment are runoff from highways, roads, and bridges, poorly managed livestock grazing, and streambank modification and destabilization.

Four sampling stations were established in the Rio Hondo watershed during a 2000 survey by NMED (see Maps 1 and 2). Surface water grab samples from all of those stations were analyzed for a variety of chemical and physical parameters. Field measurements for temperature indicated water temperature in excess of the criterion of 20° C. As a result, NMED established a TMDL for temperature on the lower watershed and it was included on the 2002-2004 and 2004-2006 Clean Water Act §303(d) list for impairment due to temperature. The chemical data from the 2000 survey were collected, assessed, and summarized in the *Special Water Quality Survey of the Upper Rio Grande Watershed Between the New Mexico-Colorado Border and Pilar, Rio Arriba and Taos Counties, New Mexico, May-October*, and data results from grab sampling are available online on EPA's STORET database.

Lower watershed residents are concerned about contamination from leaky or defective septic systems in the floodplain and severe erosion in many tributary arroyos and drainages. As with the middle watershed, some residents are concerned about

contamination from Taos Ski Valley. Even though such contamination has not been documented, there are many anecdotal stories about what appears to be nutrient-induced outbreaks of algae contaminating local *acequias*.

Water Quality Issues

The water quality impairments listed on the table are labeled “potential,” because in some cases the jury is still out. But everything listed is an issue that has been identified as an area of concern by one party or another and worth at least further investigation and monitoring, if not a full-scale restoration project. And everything listed contributes in some way to overall watershed health and function in terms of water quality and/or water yield. In a few cases the “issue” is nothing more than an educational potential, but that is just as important to long-term nonpoint source mitigation and water quality protection as on-the-ground restoration projects.

A general list of water quality issues in the watershed, more-or-less from upstream to downstream, includes:

- Unnaturally dense forest conditions and excessive fuel loading in spruce-fir and mixed conifer areas from historical fire and forestry management practices
- Acid rock drainage (ARD) and metals and sediment loading from natural hydrothermal scars
- Sediment and nutrient contamination from excessive livestock and wildlife grazing
- Acid rock drainage (ARD) and metals loading from abandoned historic mines
- Nutrient contamination from poorly designed and poorly regulated septic systems in the upper valley floodplain, open pits, holding tanks and increased growth
- Wetlands, riparian, and stream impacts from dense and poorly regulated development in the upper valley
- Sediment erosion from excessive ATV use and poorly designed and maintained recreational roads
- Erosion from unnaturally dense ponderosa and piñon-juniper woodlands where grasses and groundcover are crowded out
- Sediment erosion from road cuts along State Highway 38 and other paved roads
- Acidic groundwater seeps along the Red River
- Severe erosion from the Hondo Fire scar
- Habitat loss due to degraded and unnaturally channelized stream course
- Permitting processes (NMED, Taos County, SEO, Army Corps of Engineers)

WRAS Project Matrix

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
Upper Watershed				
Wilderness and WSA access trails	Nutrient loading	Steep trails near streams contributing sediment during runoff and thunderstorm events	Redesign trails and water bars to minimize sediment and ensure proper drainage; regular maintenance	USFS, NMED, RMYC, conservation NGOs
Patison land	Nutrient loading	Steep slope development	Wilderness and public lands acquisition	USFS, NMED, RMYC, conservation NGOs
Taos Ski Valley	Nutrient Loading	Upper watershed TMDL listed for nutrients; rapid dense residential and resort development	Education and strict enforcement of septic system regulations; TSV planning and ordinances to limit or guide development; voluntary conservation easements to restrict development along sensitive riparian areas; possible public acquisition of private lands for permanent protection	NMED, TSV, TLT, USFS, USFWS, NRCS, conservation NGOs
Taos Ski Valley and Highway 150	Nutrient Loading	Paved and unpaved roads and parking areas contributing a variety of sediment, salt and sand from winter maintenance, and other materials.	Develop local storm water ordinance and mitigate existing runoff with proper drainage and filtration	TSV, NMED, NMSHTD RMYC, conservation NGOs
Riparian corridor and narrow strip of USFS outside of wilderness and	Nutrient loading	Catastrophic wildfire prevention	NEPA process underway for forest thinning for forest health and fuels reduction	USFS, CFRP, RMYC, local community members

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
WSA				
Middle Watershed				
Cuchillo del Medio and Lower Hondo USFS Campgrounds	Nutrient loading	Sediment runoff from dirt and gravel driveways and parking areas	Redesign as necessary and feasible to minimize runoff; barricades to restrict off-road travel; mitigate runoff with gravel and proper drainage	USFS, NMED, RMYC, NMSHTD, conservation NGOs
Trailheads and dispersed parking areas	Nutrient loading	Sediment runoff from dirt parking areas at trailheads and fishing spots	Redesign as necessary and feasible to minimize runoff; barricades to restrict off-road travel; mitigate runoff with gravel and proper drainage.	USFS, NMED, RMYC, NMSHTD, conservation NGOs
Riparian corridor and narrow strip of USFS outside of wilderness and WSA	Nutrient loading	Catastrophic wildfire prevention	NEPA process underway for forest thinning for forest health and fuels reduction	USFS, CFRP, RMYC, local community members
Highway 150	Nutrient loading	Salt and sand runoff from winter maintenance	Reduce amounts used? Investigate other options?	NMSHTD, NMED, conservation NGOs
Lower Watershed				
Throughout lower watershed	Temperature	Stream bank instability: general riparian health, including non-native vegetation, streambank erosion, poorly managed livestock grazing.	Watershed restoration and erosion mitigation activities; non-native species removal; cattle guards at strategic locations; voluntary conservation easements to	Local landowners, local <i>acequias</i> , TVAA, NMED, TSWCD, NRCS, RMYC, TLT, conservation NGOs

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
			restrict development in sensitive areas.	
Deer Mesa	Temperature	Channelized and badly eroding arroyos and poor riparian conditions causing sedimentation	Watershed restoration and erosion mitigation activities; voluntary conservation easements to restrict development in sensitive areas	Local landowners, NMED, TSWCD, NRCS, RMYC, TLT, conservation NGOs
Valdez and Arroyo Hondo	Temperature	Old, leaky, or defective septic systems in floodplain	Education and strict enforcement of septic system regulations; removal of archaic systems; “living machine” community wastewater treatment facility	Local landowners, NMED, conservation NGOs
Lower Arroyo Hondo	Temperature	Channelized and badly eroding arroyos and poor riparian conditions causing sedimentation	Watershed restoration and erosion mitigation activities; voluntary conservation easements to restrict development in sensitive areas.	Local landowners, NMED, TSWCD, NRCS, RMYC, TLT, conservation NGOs

IV B. Water Quality Goals

Desired Conditions and Uses

Officially “designated uses” on the entire Rio Hondo from the top of the watershed to the Rio Grande include wildlife habitat, high quality coldwater fishery, fish culture, secondary contact, domestic water supply, livestock watering, and irrigation. These designated uses parallel the desired conditions of many watershed residents. In addition, local residents still regularly swim and wade and subsistence fish in the Rio Hondo and some residents recall drinking directly from the Rio Hondo and local *acequias* within living memory.

One priority water quality goal is to implement the proposed TMDLs for the Rio Hondo and its tributaries in as far as we are able throughout the watershed.

As the WRAS continues to evolve through an iterative, adaptive process, Watershed Group partners and working groups will determine specific desired uses and the conditions required to reach those uses for each sub-watershed and/or on a project-by-project basis. This process will involve the land management and regulatory agencies, but will also involve watershed residents and other stakeholder through an extensive outreach program. To help determine desired uses and conditions we will solicit local perspectives, values, and priorities through local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups. The scoping, designing, and implementation of projects will obviously incorporate all available information and will also utilize the best science available.

Monitoring and Assessments

To measure whether we have attained the desired uses and conditions, it will be important to establish clear water quality goals and monitoring protocols for each restoration project. Along with conventional quantitative water quality measurements, in places we will also utilize the Rosgen Stream Classification System for general assessments of stream health and fishery habitat, as well as other qualitative ecological assessments as appropriate.

Whenever possible, we will utilize all available regulatory-related water quality monitoring data, both as existing baseline data and to monitor ongoing progress. Some of the baseline data will come from the draft TMDL background monitoring and other previous water quality studies and reports. However, all up-to-date and available data will be utilized. Particular projects may be able to piggyback on the monitoring and data from the ongoing USGS Background Characterization Study. In addition to existing partners, we may find need to hire professional consultants to help design and implement water quality monitoring and other assessments.

Water quality monitoring and other assessments, before, during, and after each project, can double as an excellent opportunity for hands-on education. This approach opens

many opportunities for expanded outreach, solicits in-kind contributions to help get the work done, and provides solid experiential education for the participants.

Project and Process Evaluation

In addition to physical monitoring and assessments, it is just as important to monitor and evaluate the process of communication, collaborative planning, and project implementation on an ongoing basis. The Watershed Group will actively solicit and incorporate recommendations and input from all project partners and local residents early in the planning process. During and after every project, we will actively solicit and incorporate follow-up recommendations and input as part of an iterative adaptive management process. This is important for better project implementation, but also for improving communications, strengthening collaborative partnerships, and working toward building a broad and strong watershed-wide community.

V B. Action Plan

Still a Collaborative and Comprehensive Approach

A WRAS, by definition and intent, is a comprehensive approach that includes technical, educational, and financial components of watershed restoration. A Watershed Group may not take the lead on every project, but a main function will be to coordinate all the relevant stakeholders, information, technical resources, public educational activities, and finances for watershed restoration projects. With all projects, the Watershed Group will help coordinate compliance with all laws, regulations, and permits, particularly the legal requirements of NEPA and other federal laws for any actions on federal lands. This coordinated approach will help facilitate communication, networking, and planning between the many agency and private stakeholders, even beyond the scope of the WRAS, and will help avoid duplication of efforts.

The project matrix in Chapter III includes a preliminary list of key stakeholders and potential partners for each potential project area. As part of the project coordination, the Watershed Group will continue to identify and involve core stakeholders for each water quality issue or restoration project, incorporating existing mandates and agreements between agencies and other entities as much as possible. As with monitoring and assessments, involving and coordinating local schools and educational and non-profit conservation organizations in restoration projects will be an integral part of our effort. Again, it is an excellent opportunity to both enlist volunteers and facilitate hands-on watershed and natural resource education.

The Watershed Group will always keep in mind the fact that this WRAS is a non-regulatory, voluntary approach based not on legal obligations but on the strength of collegial collaboration, open communication, and building a watershed community. It is important for us to keep that spirit in all our restoration planning and projects. Without a formal legal framework, however, we will structure strategic partnerships and stipulate expectations between agencies and other stakeholders through formal Memoranda of

Understanding (MOUs) or Memoranda of Agreement (MOAs) to insure better follow through on restoration plans and projects. Some general MOUs and MOAs already exist between federal and state agencies.

Priorities and Timetable

Looking at the general list of water quality issues and potential problems and the potential restoration needs and projects in the project matrix in Chapter III, it is obvious that there is no shortage of restoration work in this watershed. The trick will be to strategically prioritize the projects in a way that makes sense and is achievable. We will use several criteria for determining priorities and structuring projects:

- *Consistency with existing management plans.* This might include, for instance, USFS forest thinning projects, erosion mitigation projects, grazing program modifications, or a recreation travel plan. The Taos County Comprehensive Plan calls for such things as better land use planning, protecting local water and land, preserving open space, and developing economic opportunities, all of which could well be consistent with restoration projects.
- *Fit within existing MOUs and MOAs.* Several state and federal agencies already have formal agreements and relationships through MOUs and MOAs that deal with particular issues.
- *Reflect local community concerns and priorities*
- *Potential as experimental pilot projects to test the feasibility of certain treatments.* Before taking on a larger project with uncertain results, we will test certain treatments on a smaller scale first.
- *Potential as demonstration pilot projects to generate public interest, involvement, and support.*
- *Potential for building or strengthening partnerships.* Along the lines of the previous item, building and strengthening relationships among watershed residents and stakeholders is a high priority to keep the WRAS process moving forward.
- *Availability of funding.* All projects will of course be contingent on funding.

The project matrix in Chapter III outlines water quality issues and potential restoration projects on a site-by-site basis. In general, the Watershed Group will address identified quality issues (from the list under “Water Quality Problems” in Chapter III) in the following ways:

- *Unnaturally dense forest conditions and excessive fuel loading in spruce-fir and mixed conifer areas from historical fire and forestry management practices.* Work with the USFS and local residents to develop local expertise in thinning and prescribed fire programs through the Collaborative Forest Restoration Program (CFRP) and the Wildland-Urban Interface fire program. This will also create significant opportunities for local capacity building and sustainable, small-scale economic development.
- *Sediment and nutrient contamination from excessive livestock and wildlife grazing.* Conduct impact assessment and mitigation, including the USFS’s ongoing implementation of rest-rotation grazing management and erosions control.

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- *Nutrient contamination from poorly designed and poorly regulated septic systems in the valley floodplain.* Continue the process of citizen monitoring, public education, and regulatory enforcement of Taos County and NMED regulations.
- *Wetlands, riparian, and stream impacts from dense and poorly regulated development in the upper valley.* Continue the process of public education, citizen monitoring, and regulatory enforcement of U.S. Army Corps of Engineers permits and regulations.
- *Sediment erosion from excessive ATV use and poorly designed and maintained recreational roads.* Building upon the ongoing USFS recreational road inventory and assessment, prepare a comprehensive recreational travel plan with all stakeholders, possibly including volunteer road closures, reroutes, culvert projects, and roadbed and erosion stabilization.
- *Erosion from unnaturally dense ponderosa and piñon-juniper woodlands where grasses and groundcover are crowded out.* Work with the USFS and local residents to develop local expertise in thinning and prescribed fire programs through the CFRP and the Wildland-Urban Interface fire program, and reseed native grasses. This will also create opportunities for small-scale fuelwood enterprises.
- *Sediment erosion from road cuts and other paved roads.* Working with the New Mexico State Highway & Transportation Department and NMED, conduct an impact assessment and design mitigation projects.
- *Habitat loss due to degraded and unnaturally channelized stream course.* Conduct stream morphology assessments and enhancements based on Dave Rosgen's Stream Classification System.

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Water Restoration Action Strategy
&
Non Point Source Abatement Plan



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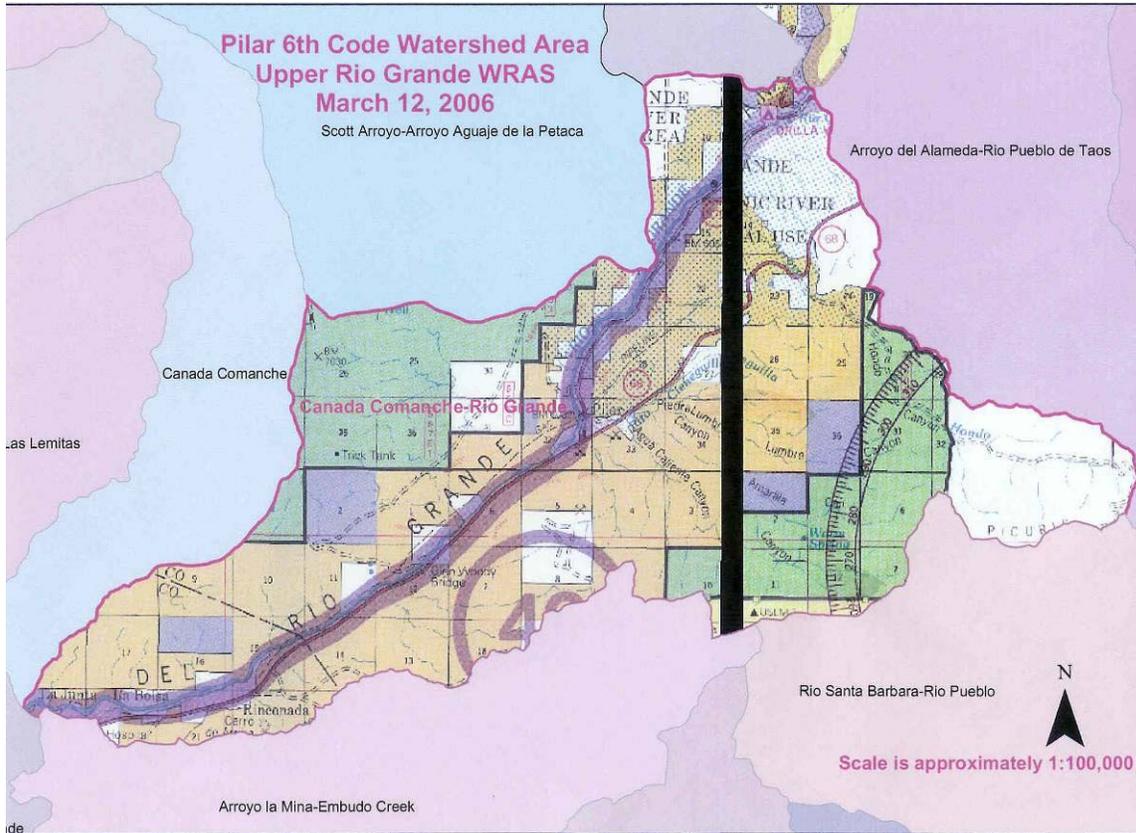


Figure 4: Pilar Watershed Map



Figure 5: Pilar Watershed

I C. Introduction: What is a WRAS?

A Collaborative and Comprehensive Approach

A Watershed Restoration Action Strategy, or WRAS, is a non-regulatory, voluntary approach to addressing nonpoint source impacts to water quality. It is based not on legal obligations but on a desire to restore watershed health and water quality through the strength of collegial collaboration, open communication, and building a watershed community among local residents, agencies, and other stakeholders. It is a general blueprint for a comprehensive, watershed-wide restoration program, one small project at a time.

The 1999 New Mexico Nonpoint Source Management Program from the New Mexico Environment Department (NMED), calls for development of WRASes for those watersheds in most need of restoration. The Pilar watershed has long been recognized by state and federal agencies as a high priority watershed, and it lies within the Upper Rio Grande watershed which is listed as a Category 1 watershed “in need of restoration.” Category 1 watersheds receive priority funding for restoration projects, and watersheds with an existing TMDL (see below), a WRAS and/or an active watershed group receive even greater consideration. So another purpose of a WRAS is to help secure and coordinate funding for restoration projects.

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This WRAS, like a community, is an evolving process. It will continue to be an organic document with the hope of remaining as fresh, useful, and relevant as possible and keeping the momentum rolling. This document represents a starting point providing a basic framework and identifying priority areas, but we will add details and layers of information as we proceed, possibly including Geographic Information System (GIS) data and maps. We hope that this document will also serve as a general watershed and resource guide for any person or entity who would like to learn more about the Pilar watershed or address water-related issues within the watershed.

This document is a product of the Pilar Watershed Group (PWG). The PWG has been working to draw together a broad-based group of watershed residents, agencies, and stakeholders to take on the immense task of restoring conditions that will improve the quality of water—and therefore the quality of life—throughout the Pilar watershed. We address a variety of water quality issues throughout the Pilar watershed through a collaborative, consensus-based approach in which every voice has equal weight.

The Pilar Watershed Group's mission is to restore the Pilar watershed to support and be safe for a variety of uses and enhance the understanding about the area waters through information and education. We pursue that mission through these four goals:

1. Determine pollutants, their sources and effects, and communicate the information to citizens.
2. Seek opportunities to enhance fish habitat within the watershed.
3. Bring citizens together to restore, protect, and fully utilize the Pilar watershed.
4. Educate and inform users and citizens about the area and watershed stewardship.

Because of the regulatory history, agencies, and processes involved, there will be an unavoidable layer of technical jargon and acronyms and abbreviations in this document. We will try to make it as reader-friendly as possible with explanations, definitions, and glossaries throughout.

Clean Water Act, TMDLs, Nonpoint Source, and Point Source Pollution

The 1972 federal Clean Water Act (CWA) is the basis of most national and state water quality standards and regulations. The CWA protects water quality in all streams, lakes, and other surface waters of the U.S. It also established the goals of eliminating the discharge of all pollutants and cleaning up all surface waters to support fish, wildlife, and recreation by 1985. Thirty years later we still haven't reached those goals, but they are the intention and the ultimate aim of the regulatory processes described below and of this WRAS, all of which grew out of the CWA.

The TMDL, or Total Maximum Daily Load, is one tool that lies at the core of the WRAS, though we hope to go well beyond its limited scope in our restoration plans. As part of the federal Clean Water Act, TMDLs set limits to particular substances identified as pollutants for any given stretch of river. The New Mexico Environment Department began working on TMDL background monitoring and sampling for the Pilar watershed in 2000 and released a final document in 2005. Only temperature has been identified as

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limited pollutants in the TMDL, but the background monitoring can provide a comprehensive picture of water quality impacts throughout the watershed.

Even for temperature, the TMDL unfortunately does not include legal mechanisms for addressing “nonpoint source” impacts, which comprise up to 50% of water quality problems nationwide. Nonpoint source pollution, according to the Environmental Protection Agency (EPA), “occurs when water runs over land or through the ground, picks up pollutants, and deposits them in surface waters or introduces them into groundwater.” It comes from scattered, often indistinct sources such as abandoned mines, agricultural runoff, erosion from denuded hillsides or streambanks, fires scars, overgrazing or overcutting, parking lots, recreational or paved roads, etc. Hence the need for a voluntary watershed group and this WRAS.

Point source discharges, on the other hand, are regulated by EPA under National Pollutant Discharge Elimination System (NPDES) permits and must meet TMDL limits. Point sources include any discharge that flows into a receiving body out of the end of a pipe or from a discrete source, such as runoff or seepage from an industrial site.

In considering the TMDL and the known source impacts in the Pilar watershed, this WRAS reflects the priorities and recommendations set forth in the 1999 New Mexico Nonpoint Source Management Program and in the 1998 Clean Water Action Plan and Unified Watershed Assessment for New Mexico.

II C. Public Outreach

Past Public Outreach Efforts

The Pilar Watershed Group recognizes that public outreach and education are just as important to long-term nonpoint source mitigation and water quality protection as on-the-ground restoration projects, quality and watershed issues. With the planning and implementation of projects outlined in this WRAS, we will continue and expand that process. Through our outreach, the Watershed Group has worked to establish credibility among a broad spectrum of watershed interests and develop our role as an open forum, reliable information clearinghouse, and source of unbiased watershed information.

Key ingredients for successful public outreach include 1) clearly identifying what’s in this for local residents and stakeholders, 2) keeping the process and the information clear, jargon-free, and accessible to a wide diversity of the general public, and 3) striving for maximum buy-in through relationships, projects, and solutions that are collaborative and collegial.

It is an unending process, but the Watershed Group will continue to address the public interest in terms of important issues related to water quality, including fishing, drinking water, agriculture, recreation, aesthetics, property values, and general quality of life.

Ongoing and Future Public Outreach

The Pilar Watershed Group continues to solicit input and conduct outreach, and will expand that process through the implementation of projects outlined in this WRAS, through a variety of organizations and venues, including:

- Members of the Pilar Watershed Group (local residents, non-profit organizations, local, state, and federal agencies, other stakeholders)
- Community constituents (acequias, ranchers, schools, traditional community)
- Outdoor interests (anglers, river runners, hikers)
- Local businesses (fishing, whitewater rafting, horseback outfitters and other outdoor sports, realtors, developers)
- ongoing TMDL development under the New Mexico Environment Department (NMED)
- acequia associations

In particular, the Watershed Group will also involve watershed residents and other stakeholders, along with land management and regulatory agencies, in the decision making process through a combination of local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups to help determine local water quality perspectives, values, and restoration priorities using sound scientific and technical expertise. We will also continue to take advantage of a variety of media and approaches for effective and creative public outreach and education, including oral histories, publications, and public events.

Details on coordinating cross-agency and public involvement are found in the Action Plan for this WRAS in Chapter V.

III C. Watershed Inventory and Assessment

Watershed Description

WRAS Project Matrix Description

The project matrix is the core of this WRAS, providing a watershed-wide overview of 1) potential water quality issues and potential impairments, 2) potential restoration needs and projects, and 3) key stakeholders and potential partners. We recognize the fact that this table is not as detailed and exacting as it might be, but given the physical, historical, cultural, jurisdictional, and water quality complexities of this particular watershed, it is the most comprehensive water quality overview and watershed restoration blueprint to date. In some cases the table provides specific direction; at the very least it is a springboard from which to move forward to more completely identify potential water quality problems and restoration projects.

Information Needs and Sources

In the spirit of approaching this WRAS as a living, working document, the Pilar Watershed Group and its partners will continue to build on the overview presented in the table with additional layers of information and detail as we move forward with specific restoration projects. Some of the information we will continue to gather and add to the WRAS process includes:

- Additional maps, possibly including layered GIS maps
- Specifics on soils and vegetation
- Hydrogeology data
- More detail on surface water quality concerns
- Stream morphology assessments
- Abandoned mine inventory and assessment
- Inventory and assessment of U.S. Forest Service (USFS) and recreational roads
- Specific data on state highway impacts
- Details on jurisdiction, ownership, and land use
- Historical uses, traditional values, local knowledge
- Recognition of rapid changes in uses of land and water
- Recognition of regulation changes

Potential sources for this information include:

- Ongoing USFS inventory and assessment of national forest and recreational roads
- NMED TMDL background monitoring data and other studies
- New Mexico Office of the Natural Resources Trustee
- U.S. Geological Survey (USGS) Background Characterization Study
- U.S. Fish & Wildlife Service (USFWS) studies
- New Mexico Department of Fish & Game (NMDGF) studies
- New Mexico State Highway & Transportation Department (NMSHTD) information
- Taos County Planning Department
- New Mexico State Historical Archives

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- BLM tamarisk removal
- Amigos Bravos library
- Personal libraries and archives of watershed residents
- Oral histories and local knowledge

Water Quality Problems

The water quality impairments listed on the table are labeled “potential,” because in some cases the jury is still out. But everything listed is an issue that has been identified as an area of concern by one party or another and worth at least further investigation and monitoring, if not a full-scale restoration project. And everything listed contributes in some way to overall watershed health and function in terms of water quality and/or water yield. In a few cases the “issue” is nothing more than an educational potential, but that is just as important to long-term nonpoint source mitigation and water quality protection as on-the-ground restoration projects.

A general list of water quality issues in the watershed, more-or-less from upstream to downstream, includes:

- Sediment and nutrient contamination from excessive livestock and wildlife grazing
- Nutrient contamination from poorly designed and poorly regulated septic systems
- Wetlands, riparian, and stream impacts from dense and poorly regulated development
- Sediment erosion from road cuts along State Highway 68 and other paved roads
- Habitat loss due to degraded and unnaturally channelized stream course
- Permitting processes (NMED, Taos County, SEO, Army Corps of Engineers)

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WRAS Project Matrix

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
Rito Cienequilla	Sedimentation, Siltation, Nitrates	Extreme down arroyo down cutting Highway storm run off, petrochemicals Livestock grazing	Pos	BLM, NMED, NM DOT Taos County, Pilar watershed group, citizens, private property owners
Aqua Caliente	Sedimentation, Siltation	Stream bank instability Potential catastrophic failure of storage facility	Riparian restoration Storage pond restoration	Pilar acequia association, Pilar watershed group, NMED
West side of the Rio Grande within the Village of Pilar	Salinity, Nitrates	Impairment of drinking water well quality Livestock grazing	Evaluate sources septic vs. background Create buffers between pastures and water courses	Acequias, soil and water conservation districts, Larry Samolka BLM, Taos County, NMED, Private property owners
Orilla Verde BLM Park/ Klauer Springs	Fecal choliform	Impairment of drinking water spring quality	Upper watershed protection, Grazing exclosures, grazing allotments	Carson Estates, the Village of Pilar
Orilla Verde	Sedimentation, Siltation	Stream bank erosion and instability	Riparian restoration, Cottonwood	BLM, Taos SWCD, Rio Grande Restoration, Amigos Bravos
Rio Petaca	Sedimentation, Siltation	Stream bank erosion and instability	Tamarisk removal	BLM, Taos SWCD, Rio Grande Restoration, Amigos Bravos, Carson Estates
Arroyo Hondo side drainage	Sedimentation, Siltation	Stream bank erosion and instability	Tamarisk removal	BLM, Taos SWCD, Rio Grande Restoration, Amigos Bravos
Center of the Village of Pilar	Sedimentation, Siltation	Stream bank erosion and instability	Riparian restoration, Cottonwood	Pilar Watershed Group, Mark Robertson
Glenwoody Historic Gold Mine site, along main stem of the Rio Grande downstream of the Village of Pilar	Heavy metals?	arsenic, cyanide deposits in old river channels	Study deposits and water quality in and near the old river channels along the mine site	NMED, NM Trustee, private property owners, river boaters
Old dump		Potential PCB contamination	Soil sampling	

Pilar WRAS

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
Rinconada				
Village of Rinconada	Sedimentation, Siltation	Soil slope instability, historically heavily grazed Stream bank erosion and instability	Grazing management Tamarisk removal	BLM, Taos SWCD, Rio Grande Restoration, Amigos Bravos

IV C. Water Quality Goals

Desired Conditions and Uses

One priority water quality goal is to implement the proposed TMDLs for the Pilar watershed.

As the WRAS continues to evolve through an iterative, adaptive process, Watershed Group partners and working groups will determine specific desired uses and the conditions required to reach those uses for each subwatershed and/or on a project-by-project basis. This process will involve the land management and regulatory agencies, but will also involve watershed residents and other stakeholder through an extensive outreach program. To help determine desired uses and conditions we will solicit local perspectives, values, and priorities through local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups. The scoping, designing, and implementation of projects will obviously incorporate all available information and will also utilize the best science available.

Monitoring and Assessments

To measure whether we have attained the desired uses and conditions, it will be important to establish clear water quality goals and monitoring protocols for each restoration project. Along with conventional quantitative water quality measurements, in places we will also utilize the Rosgen Stream Classification System for general assessments of stream health and fishery habitat, as well as other qualitative ecological assessments as appropriate.

Whenever possible, we will utilize all available regulatory-related water quality monitoring data, both as existing baseline data and to monitor ongoing progress. Some of the baseline data will come from the draft TMDL background monitoring and other previous water quality studies and reports. However, all up-to-date and available data will be utilized. Particular projects may be able to piggyback on the monitoring and data from the ongoing USGS Background Characterization Study. In addition to existing partners, we may find need to hire professional consultants to help design and implement water quality monitoring and other assessments.

Water quality monitoring and other assessments, before, during, and after each project, can double as an excellent opportunity for hands-on education. This approach opens many opportunities for expanded outreach, solicits in-kind contributions to help get the work done, and provides solid experiential education for the participants.

Project and Process Evaluation

In addition to physical monitoring and assessments, it is just as important to monitor and evaluate the process of communication, collaborative planning, and project implementation on an ongoing basis. The Watershed Group will actively solicit and incorporate recommendations and input from all project partners and local residents early

in the planning process. During and after every project, we will actively solicit and incorporate follow-up recommendations and input as part of an iterative adaptive management process. This is important for better project implementation, but also for improving communications, strengthening collaborative partnerships, and working toward building a broad and strong watershed-wide community.

V C. Action Plan

Still a Collaborative and Comprehensive Approach

A WRAS, by definition and intent, is a comprehensive approach that includes technical, educational, and financial components of watershed restoration. A Watershed Group may not take the lead on every project, but a main function will be to coordinate all the relevant stakeholders, information, technical resources, public educational activities, and finances for watershed restoration projects. With all projects, the Watershed Group will help coordinate compliance with all laws, regulations, and permits, particularly the legal requirements of NEPA and other federal laws for any actions on federal lands. This coordinated approach will help facilitate communication, networking, and planning among the many agency and private stakeholders, even beyond the scope of the WRAS, and will help avoid duplication of efforts.

The project matrix in Chapter III includes a preliminary list of key stakeholders and potential partners for each potential project area. As part of the project coordination, the Watershed Group will continue to identify and involve core stakeholders for each water quality issue or restoration project, incorporating existing mandates and agreements between agencies and other entities as much as possible. As with monitoring and assessments, involving and coordinating local schools and educational and non-profit conservation organizations in restoration projects will be an integral part of our effort. Again, it is an excellent opportunity to both enlist volunteers and facilitate hands-on watershed and natural resource education.

The Watershed Group will always keep in mind the fact that this WRAS is a non-regulatory, voluntary approach based not on legal obligations but on the strength of collegial collaboration, open communication, and building a watershed community. It is important for us to keep that spirit in all our restoration planning and projects. Without a formal legal framework, however, we will structure strategic partnerships and stipulate expectations between agencies and other stakeholders through formal Memoranda of Understanding (MOUs) or Memoranda of Agreement (MOAs) to insure better follow through on restoration plans and projects. Some general MOUs and MOAs already exist between federal and state agencies.

Priorities and Timetable

Looking at the general list of water quality issues and potential problems and the potential restoration needs and projects in the project matrix in Chapter III, it is obvious that there is no shortage of restoration work in this watershed. The trick will be to

strategically prioritize the projects in a way that makes sense and is achievable. We will use several criteria for determining priorities and structuring projects:

- *Consistency with existing management plans.* This might include, for instance, USFS forest thinning projects, erosion mitigation projects, grazing program modifications, or a recreation travel plan. The Taos County Comprehensive Plan calls for such things as better land use planning, protecting local water and land, preserving open space, and developing economic opportunities, all of which could well be consistent with restoration projects.
- *Fit within existing MOUs and MOAs.* Several state and federal agencies already have formal agreements and relationships through MOUs and MOAs that deal with particular issues.
- *Reflect local community concerns and priorities*
- *Potential as experimental pilot projects to test the feasibility of certain treatments.* Before taking on a larger project with uncertain results, we will test certain treatments on a smaller scale first.
- *Potential as demonstration pilot projects to generate public interest, involvement, and support.*
- *Potential for building or strengthening partnerships.* Along the lines of the previous item, building and strengthening relationships among watershed residents and stakeholders is a high priority to keep the WRAS process moving forward.
- *Availability of funding.* All projects will of course be contingent on funding.

The project matrix in Chapter III outlines water quality issues and potential restoration projects on a site-by-site basis. In general, the Watershed Group will address identified quality issues (from the list under “Water Quality Problems” in Chapter III) in the following ways:

- *Sediment and nutrient contamination from excessive livestock and wildlife grazing.* Conduct impact assessment and mitigation, including the USFS’s ongoing implementation of rest-rotation grazing management and erosions control.
- *Nutrient contamination from poorly designed and poorly regulated septic systems.* Continue the process of citizen monitoring, public education, and regulatory enforcement of Taos County and NMED regulations.
- *Wetlands, riparian, and stream impacts from dense and poorly regulated development.* Continue the process of public education, citizen monitoring, and regulatory enforcement of U.S. Army Corps of Engineers permits and regulations.
- *Sediment erosion from road cuts and other paved roads.* Working with the New Mexico State Highway & Transportation Department and NMED, conduct an impact assessment and design mitigation projects.
- *Habitat loss due to degraded and unnaturally channelized stream course.* Conduct stream morphology assessments and enhancements based on Dave Rosgen’s Stream Classification System.

**San Cristobal NM WRAS
Water Restoration Action Strategy
&
Non Point Source Abatement Plan**



DRAFT – July 22, 2006

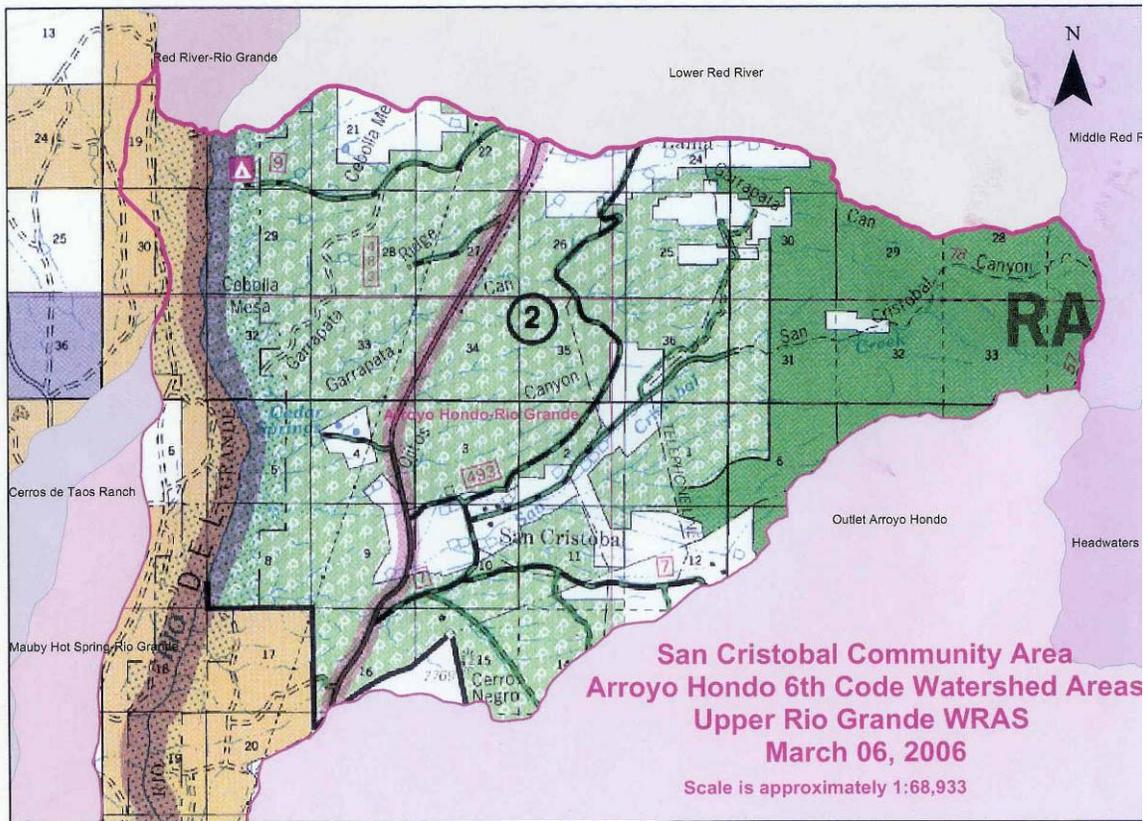


Figure 6: San Cristobal Watershed Map

I D. Introduction: What is a WRAS?

A Collaborative and Comprehensive Approach

A Watershed Restoration Action Strategy, or WRAS, is a non-regulatory, voluntary approach to addressing non-point source impacts to water quality. It is based not on legal obligations but on a desire to restore watershed health and water quality through the strength of collegial collaboration, open communication, and building a watershed community among local residents, agencies, and other stakeholders. It is a general blueprint for a comprehensive, watershed-wide restoration program, one small project at a time.

This WRAS, like a community, is an evolving process. It will continue to be an organic document with the hope of remaining as fresh, useful, and relevant as possible and keeping the momentum rolling. This document represents a starting point providing a basic framework and identifying priority areas, but we will add details and layers of information as we proceed, possibly including Geographic Information System (GIS) data and maps. We hope that this document will also serve as a general watershed and resource guide for any person or entity who would like to learn more about the San Cristobal watershed or address water-related issues within the watershed.

This document is a product of the San Cristobal Watershed Group. The SCWG has been working to draw together a broad-based group of watershed residents, agencies, and stakeholders to take on the immense task of restoring conditions that will improve the quality of water—and therefore the quality of life—throughout the San Cristobal watershed. We address a variety of water quality issues throughout the San Cristobal watershed through a collaborative, consensus-based approach in which every voice has equal weight.

The San Cristobal Watershed Group's mission is to restore the San Cristobal watershed to support and be safe for a variety of uses and enhance the understanding about the area waters through information and education. We pursue that mission through these four goals:

1. Determine pollutants, their sources and effects, and communicate the information to citizens.
2. Seek opportunities to enhance fish habitat within the watershed.
3. Bring citizens together to restore, protect, and fully utilize the San Cristobal watershed.
4. Educate and inform users and citizens about the area and watershed stewardship.

Because of the regulatory history, agencies, and processes involved, there will be an unavoidable layer of technical jargon and acronyms and abbreviations in this document. We will try to make it as reader-friendly as possible with explanations, definitions, and glossaries throughout.

Clean Water Act, TMDLs, Non-point Source, and Point Source Pollution

The 1972 federal Clean Water Act (CWA) is the basis of most national and state water quality standards and regulations. The CWA protects water quality in all streams, lakes, and other surface waters of the U.S. It also established the goals of eliminating the discharge of all pollutants and cleaning up all surface waters to support fish, wildlife, and recreation by 1985. Thirty years later we still haven't reached those goals, but they are the intention and the ultimate aim of the regulatory processes described below and of this WRAS, all of which grew out of the CWA.

The TMDL, or Total Maximum Daily Load, is one tool that lies at the core of the WRAS, though we hope to go well beyond its limited scope in our restoration plans. As part of the federal Clean Water Act, TMDLs set limits to particular substances identified as pollutants for any given stretch of river. Background monitoring can provide a comprehensive picture of water quality impacts throughout the watershed.

Even for these few listed materials, the TMDL unfortunately does not include legal mechanisms for addressing "non-point source" impacts, which comprise up to 50% of water quality problems nationwide. Non-point source pollution, according to the Environmental Protection Agency (EPA), "occurs when water runs over land or through the ground, picks up pollutants, and deposits them in surface waters or introduces them into groundwater." It comes from scattered, often indistinct sources such as abandoned mines, agricultural runoff, erosion from denuded hillsides or streambanks, fires scars, overgrazing or overcutting, parking lots, recreational or paved roads, etc. Hence the need for a voluntary watershed group and this WRAS.

Point source discharges, on the other hand, are regulated by EPA under National Pollutant Discharge Elimination System (NPDES) permits and must meet TMDL limits. Point sources include any discharge that flows into a receiving body out of the end of a pipe or from a discrete source, such as runoff or seepage from an industrial site.

II D. Public Outreach

Past Public Outreach Efforts

The San Cristobal Watershed Group recognizes that public outreach and education are just as important to long-term non-point source mitigation and water quality protection as on-the-ground restoration projects. With the planning and implementation of projects outlined in this WRAS, we will continue and expand that process

Key ingredients for successful public outreach include 1) clearly identifying what's in this for local residents and stakeholders, 2) keeping the process and the information clear, jargon-free, and accessible to a wide diversity of the general public, and 3) striving for maximum buy-in through relationships, projects, and solutions that are collaborative and collegial.

It is an unending process, but the Watershed Group will continue to address the public

interest in terms of important issues related to water quality, drinking water, agriculture, recreation, aesthetics, property values, and general quality of life.

Ongoing and Future Public Outreach

The San Cristobal Watershed Group continues to solicit input and conduct outreach, and will expand that process through the implementation of projects outlined in this WRAS, through a variety of organizations and venues, including:

- Members of the San Cristobal Watershed Group (local residents, non-profit organizations, local, state, and federal agencies, other stakeholders)
- Community constituents (acequias, foresters, ranchers, schools, traditional community)

In particular, the Watershed Group will also involve watershed residents and other stakeholders, along with land management and regulatory agencies, in the decision making process through a combination of local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups to help determine local water quality perspectives, values, and restoration priorities using sound scientific and technical expertise. We will also continue to take advantage of a variety of media and approaches for effective and creative public outreach and education, including oral histories, publications, and public events.

Details on coordinating cross-agency and public involvement are found in the Action Plan for this WRAS in Chapter V.

III D. Watershed Inventory and Assessment

Watershed Description

San Cristobal Creek runs for 9.64 miles from its headwaters in the high country through the valley and village of San Cristobal to where it empties into the Rio Grande approximately midway between the Rio Hondo and the Red River. Because much of the watershed is in the Columbine-Hondo Wilderness Study Area, management has been limited. There is some recreational use – trails and trail clearing. The water from the creek is important to wildlife habitat and is used for livestock watering and irrigation. There is some grazing in the area. There is no history of mining.

Meandering between a river and a mountainside, an earthen ditch first dug by Spanish colonists in the 1500s was no longer meeting the needs of the people of San Cristobal. The community tried traditional methods, including concrete formed lining and PVC pipe, to repair the 1.1-mile ditch. But those methods failed; the site's rugged terrain prohibited the use of heavy installation equipment. In 2004, a 36-inch semicircular Fast Ditch liner was completed and the ditch has required little maintenance since.

WRAS Project Matrix Description

The project matrix is the core of this WRAS, providing a watershed-wide overview of 1) potential water quality issues and potential impairments, 2) potential restoration needs and projects, and 3) key stakeholders and potential partners. We recognize the fact that this table is not as detailed and exacting as it might be, but given the physical, historical, cultural, jurisdictional, and water quality complexities of this particular watershed, it is the most comprehensive water quality overview and watershed restoration blueprint to date. In some cases the table provides specific direction; at the very least it is a springboard from which to move forward to more completely identify potential water quality problems and restoration projects.

Information Needs and Sources

In the spirit of approaching this WRAS as a living, working document, the San Cristobal Watershed Group and its partners will continue to build on the overview presented in the table with additional layers of information and detail as we move forward with specific restoration projects. Some of the information we will continue to gather and add to the WRAS process includes:

- Additional maps, possibly including layered GIS maps
- Specifics on soils and vegetation
- Hydrogeology data
- More detail on surface water quality concerns
- Stream morphology assessments
- Inventory and assessment of U.S. Forest Service (USFS) and recreational roads

- Specific data on state highway impacts
- Details on jurisdiction, ownership, and land use
- Historical uses, traditional values, local knowledge
- Recognition of rapid changes in uses of land and water
- Recognition of regulation changes

Potential sources for this information include:

- Ongoing USFS inventory and assessment of national forest and recreational roads
- New Mexico Office of the Natural Resources Trustee
- New Mexico State Highway & Transportation Department (NMSHTD) information
- Taos County Planning Department
- New Mexico State Historical Archives
- Amigos Bravos library
- Personal libraries and archives of watershed residents
- Oral histories and local knowledge

Water Quality Problems

The water quality impairments listed on the table are labeled “potential,” because in some cases the jury is still out. But everything listed is an issue that has been identified as an area of concern by one party or another and worth at least further investigation and monitoring, if not a full-scale restoration project. And everything listed contributes in some way to overall watershed health and function in terms of water quality and/or water yield. In a few cases the “issue” is nothing more than an educational potential, but that is just as important to long-term non-point source mitigation and water quality protection as on-the-ground restoration projects.

A general list of water quality issues in the watershed, more-or-less from upstream to downstream, includes:

- Sediment and nutrient contamination from excessive livestock and wildlife grazing
- Nutrient contamination from poorly designed and poorly regulated septic systems
- Wetlands, riparian, and stream impacts from dense and poorly regulated development in the upper valley
- Sediment erosion from excessive ATV use and poorly designed and maintained recreational roads
- Sediment erosion from road cuts along FS Rd 7 and other paved roads
- Erosion from the Hondo Fire scar
- Habitat loss due to degraded and unnaturally channelized stream course
- Sufficient water for the mutual domestic system

WRAS Project Matrix

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
Whole Watershed	Erosion Sedimentation	Channelized and badly eroding arroyos and poor riparian conditions causing sedimentation	Watershed restoration and erosion mitigation activities; voluntary conservation easements to restrict development in sensitive areas	NMED, USFS, State Forestry, UNM, BLM, Local landowners, Taos SWCD, NRCS, RMYC, TLT, Taos County, conservation NGOs
	Fecal coliform	Old, leaky, or defective septic systems	Education and strict enforcement of septic system regulations; removal of archaic systems;	NMED, local landowners Taos County, Taos SWCD

IV D. Water Quality Goals

Desired Conditions and Uses

One priority water quality goal is to implement TMDLs for the San Cristobal watershed.

As the WRAS continues to evolve through an iterative, adaptive process, Watershed Group partners and working groups will determine specific desired uses and the conditions required to reach those uses for each subwatershed and/or on a project-by-project basis. This process will involve the land management and regulatory agencies, but will also involve watershed residents and other stakeholder through an extensive outreach program. To help determine desired uses and conditions we will solicit local perspectives, values, and priorities through local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups. The scoping, designing, and implementation of projects will obviously incorporate all available information and will also utilize the best science available.

Monitoring and Assessments

To measure whether we have attained the desired uses and conditions, it will be important to establish clear water quality goals and monitoring protocols for each restoration project. Along with conventional quantitative water quality measurements, in places we will also utilize the Rosgen Stream Classification System for general assessments of stream health and fishery habitat, as well as other qualitative ecological assessments as appropriate.

Whenever possible, we will utilize all available regulatory-related water quality monitoring data, both as existing baseline data and to monitor ongoing progress. Some of the baseline data will come from the draft TMDL background monitoring and other previous water quality studies and reports. However, all up-to-date and available data will be utilized. In addition to existing partners, we may find need to hire professional consultants to help design and implement water quality monitoring and other assessments.

Water quality monitoring and other assessments, before, during, and after each project, can double as an excellent opportunity for hands-on education. This approach opens many opportunities for expanded outreach, solicits in-kind contributions to help get the work done, and provides solid experiential education for the participants.

Project and Process Evaluation

In addition to physical monitoring and assessments, it is just as important to monitor and evaluate the process of communication, collaborative planning, and project implementation on an ongoing basis. The Watershed Group will actively solicit and incorporate recommendations and input from all project partners and local residents early

in the planning process. During and after every project, we will actively solicit and incorporate follow-up recommendations and input as part of an iterative adaptive management process. This is important for better project implementation, but also for improving communications, strengthening collaborative partnerships, and working toward building a broad and strong watershed-wide community.

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A WRAS, by definition and intent, is a comprehensive approach that includes technical, educational, and financial components of watershed restoration. A Watershed Group may not take the lead on every project, but a main function will be to coordinate all the relevant stakeholders, information, technical resources, public educational activities, and finances for watershed restoration projects. With all projects, the Watershed Group will help coordinate compliance with all laws, regulations, and permits, particularly the legal requirements of NEPA and other federal laws for any actions on federal lands. This coordinated approach will help facilitate communication, networking, and planning between the many agency and private stakeholders, even beyond the scope of the WRAS, and will help avoid duplication of efforts.

The project matrix in Chapter III includes a preliminary list of key stakeholders and potential partners for each potential project area. As part of the project coordination, the Watershed Group will continue to identify and involve core stakeholders for each water quality issue or restoration project, incorporating existing mandates and agreements between agencies and other entities as much as possible. As with monitoring and assessments, involving and coordinating local schools and educational and non-profit conservation organizations in restoration projects will be an integral part of our effort. Again, it is an excellent opportunity to both enlist volunteers and facilitate hands-on watershed and natural resource education.

The Watershed Group will always keep in mind the fact that this WRAS is a non-regulatory, voluntary approach based not on legal obligations but on the strength of collegial collaboration, open communication, and building a watershed community. It is important for us to keep that spirit in all our restoration planning and projects. Without a formal legal framework, however, we will structure strategic partnerships and stipulate expectations between agencies and other stakeholders through formal Memoranda of Understanding (MOUs) or Memoranda of Agreement (MOAs) to insure better follow through on restoration plans and projects. Some general MOUs and MOAs already exist between federal and state agencies.

Priorities and Timetable

Looking at the general list of water quality issues and potential problems and the potential restoration needs and projects in the project matrix in Chapter III, it is obvious that there is no shortages of restoration work in this watershed. The trick will be to

strategically prioritize the projects in a way that makes sense and is achievable. We will use several criteria for determining priorities and structuring projects:

- *Consistency with existing management plans.* This might include, for instance, USFS forest thinning projects, erosion mitigation projects, grazing program modifications. The Taos County Comprehensive Plan calls for such things as better land use planning, protecting local water and land, preserving open space, and developing economic opportunities, all of which could well be consistent with restoration projects.
- *Fit within existing MOUs and MOAs.* Several state and federal agencies already have formal agreements and relationships through MOUs and MOAs that deal with particular issues.
- *Reflect local community concerns and priorities*
- *Potential as experimental pilot projects to test the feasibility of certain treatments.* Before taking on a larger project with uncertain results, we will test certain treatments on a smaller scale first.
- *Potential as demonstration pilot projects to generate public interest, involvement, and support.*
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- *Availability of funding.* All projects will of course be contingent on funding.

The project matrix in Chapter III outlines water quality issues and potential restoration projects on a site-by-site basis. In general, the Watershed Group will address identified quality issues (from the list under “Water Quality Problems” in Chapter III) in the following ways:

- *Sediment and nutrient contamination from excessive livestock and wildlife grazing.* Conduct impact assessment and mitigation, including the USFS’s ongoing implementation of rest-rotation grazing management and erosions control.
 - *Nutrient contamination from poorly designed and poorly regulated septic systems.* Continue the process of citizen monitoring, public education, and regulatory enforcement of Taos County and NMED regulations.
 - *Sediment erosion from excessive ATV use.* Building upon the ongoing USFS recreational road inventory and assessment, prepare a comprehensive recreational travel plan with all stakeholders, possibly including volunteer road closures, reroutes, culvert projects, and roadbed and erosion stabilization.
 - *Sediment erosion from road cuts and other paved roads.* Working with the New Mexico State Highway & Transportation Department, NMED, and USFS, conduct an impact assessment and design mitigation projects.
- Habitat loss due to degraded and unnaturally channelized stream course.* Conduct stream morphology assessments and enhancements based on Dave Rosgen’s Stream Classification System.

Ranchos de Taos NM WRAS
Water Restoration Action Strategy
&
Non Point Source Abatement Plan



DRAFT – July 22, 2006

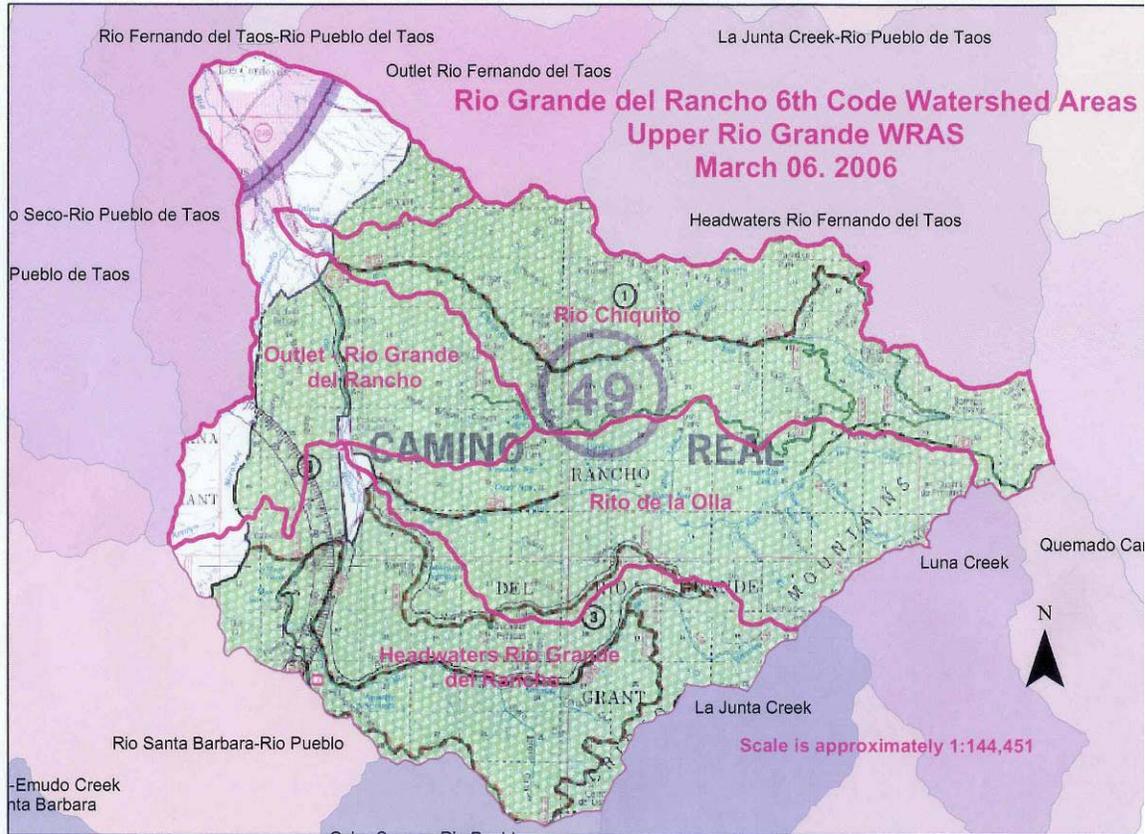


Figure 7: Ranchos de Taos Watershed Map

I E. Introduction: What is a WRAS?

A Collaborative and Comprehensive Approach

A Watershed Restoration Action Strategy, or WRAS, is a non-regulatory, voluntary approach to addressing non-point source impacts to water quality. It is based not on legal obligations but on a desire to restore watershed health and water quality through the strength of collegial collaboration, open communication, and building a watershed community among local residents, agencies, and other stakeholders. It is a general blueprint for a comprehensive, watershed-wide restoration program, one small project at a time.

The 1999 New Mexico Non-point Source Management Program from the New Mexico Environment Department (NMED), calls for development of WRASes for those watersheds in most need of restoration. The Ranchos de Taos has long been recognized by state and federal agencies as a high value watershed, and it lies within the Upper RioGrande watershed which is listed as a Category 1 watershed “in need of restoration.” Category 1 watersheds receive priority funding for restoration projects, and watersheds with an existing TMDL (see below), a WRAS and/or an active watershed group receive even greater consideration. So another purpose of a WRAS is to help secure and coordinate funding for restoration projects.

This WRAS, like a community, is an evolving process. It will continue to be an organic document with the hope of remaining as fresh, useful, and relevant as possible and keeping the momentum rolling. This document represents a starting point providing a basic framework and identifying priority areas, but we will add details and layers of information as we proceed, possibly including Geographic Information System (GIS) data and maps. We hope that this document will also serve as a general watershed and resource guide for any person or entity who would like to learn more about the Ranchos de Taos watershed or address water-related issues within the watershed.

Others need to be brought into the process, drawing together a broad-based group of watershed residents, agencies, and stakeholders to take on the immense task of restoring conditions that will improve the quality of water—and therefore the quality of life—throughout the Ranchos de Taos watershed. The existing Ranchos de Taos Neighborhood Association could serve as a forum to address a variety of water quality issues throughout the entire drainage of the Ranchos de Taos/Rio Pueblo and its tributaries through a collaborative, consensus-based approach in which every voice has equal weight.

The Ranchos de Taos Neighborhood Association's mission is to restore the Ranchos de Taos watershed to support and be safe for a variety of uses and enhance the understanding about the area waters through information and education. We pursue that mission through these four goals:

1. Determine pollutants, their sources and effects, and communicate the information to citizens.
2. Bring citizens together to restore, protect, and fully utilize the Ranchos de Taos watershed.

3. Educate and inform users and citizens about the area and watershed stewardship.

Because of the regulatory history, agencies, and processes involved, there will be an unavoidable layer of technical jargon and acronyms and abbreviations in this document. We will try to make it as reader-friendly as possible with explanations, definitions, and glossaries throughout.

Clean Water Act, TMDLs, Non-point Source, and Point Source Pollution

The 1972 federal Clean Water Act (CWA) is the basis of most national and state water quality standards and regulations. The CWA protects water quality in all streams, lakes, and other surface waters of the U.S. It also established the goals of eliminating the discharge of all pollutants and cleaning up all surface waters to support fish, wildlife, and recreation by 1985. Thirty years later we still haven't reached those goals, but they are the intention and the ultimate aim of the regulatory processes described below and of this WRAS, all of which grew out of the CWA.

The TMDL, or Total Maximum Daily Load, is one tool that lies at the core of the WRAS, though we hope to go well beyond its limited scope in our restoration plans. As part of the federal Clean Water Act, TMDLs set limits to particular substances identified as pollutants for any given stretch of river. The New Mexico Environment Department began working on TMDL background monitoring for the Ranchos de Taos in 1999 and released a draft document in 2003. Only specific conductance has so far been identified as limited pollutants in the draft TMDL, but the background monitoring can provide a comprehensive picture of water quality impacts throughout the watershed.

Even for these few listed materials, the TMDL unfortunately does not include legal mechanisms for addressing “non-point source” impacts, which comprise up to 50% of water quality problems nationwide. Non-point source pollution, according to the Environmental Protection Agency (EPA), “occurs when water runs over land or through the ground, picks up pollutants, and deposits them in surface waters or introduces them into groundwater.” It comes from scattered, often indistinct sources such as abandoned mines, agricultural runoff, erosion from denuded hillsides or streambanks, fires scars, overgrazing or overcutting, parking lots, recreational or paved roads, etc. Hence the need for a voluntary watershed group and this WRAS.

Point source discharges, on the other hand, are regulated by EPA under National Pollutant Discharge Elimination System (NPDES) permits and must meet TMDL limits. Point sources include any discharge that flows into a receiving body out of the end of a pipe or from a discrete source, such as runoff or seepage from an industrial site.

In considering the TMDL and the known source impacts in the Ranchos de Taos watershed, this WRAS reflects the priorities and recommendations set forth in the 1999 New Mexico Non-point Source Management Program and in the 1998 Clean Water Action Plan and Unified Watershed Assessment for New Mexico.

II E. Public Outreach

Past Public Outreach Efforts

The Ranchos de Taos Neighborhood Association recognizes that public outreach and education are just as important to long-term non-point source mitigation and water quality protection as on-the-ground restoration projects. To that end, the community has been actively conducting outreach and education on various land use issues, water quality and watershed issues. With the planning and implementation of projects outlined in this WRAS, community members will continue and expand that process.

Key ingredients for successful public outreach include 1) clearly identifying what's in this for local residents and stakeholders, 2) keeping the process and the information clear, jargon-free, and accessible to a wide diversity of the general public, and 3) striving for maximum buy-in through relationships, projects, and solutions that are collaborative and collegial.

Ongoing and Future Public Outreach

The Ranchos de Taos Neighborhood Association will continue to solicit input and conduct outreach, and will expand the process through implementation of projects outlined in this WRAS, through a variety of organizations and venues, including:

- Neighborhood associations (local residents, non-profit organizations, local, state, and federal agencies, other stakeholders)
- Community constituents (acequias, foresters, ranchers, schools)
- Outdoor interests (recreationists)
- Local businesses
- ongoing TMDL development under the New Mexico Environment Department (NMED)

In particular, the Ranchos de Taos Neighborhood Association will also involve watershed residents and other stakeholders, along with land management and regulatory agencies, in the decision making process through a combination of local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups to help determine local water quality perspectives, values, and restoration priorities using sound scientific and technical expertise. We will also continue to take advantage of a variety of media and approaches for effective and creative public outreach and education, including oral histories, publications, and public events.

Details on coordinating cross-agency and public involvement are found in the Action Plan for this WRAS in Chapter V.



Figure 8: Ranchos de Taos Watershed

III E. Watershed Inventory and Assessment

Watershed Description

WRAS Project Matrix Description

The project matrix is the core of this WRAS, providing a watershed-wide overview of 1) potential water quality issues and potential impairments, 2) potential restoration needs and projects, and 3) key stakeholders and potential partners. We recognize the fact that this table is not as detailed and exacting as it might be, but given the physical, historical, cultural, jurisdictional, and water quality complexities of this particular watershed, it is the most comprehensive water quality overview and watershed restoration blueprint to date. In some cases the table provides specific direction; at the very least it is a springboard from which to move forward to more completely identify potential water quality problems and restoration projects.

Information Needs and Sources

In the spirit of approaching this WRAS as a living, working document, the Ranchos de Taos Neighborhood Association and its partners will continue to build on the overview presented in the table with additional layers of information and detail as we move forward with specific restoration projects. Some of the information we will continue to gather and add to the WRAS process includes:

- Additional maps, possibly including layered GIS maps

- Specifics on soils and vegetation
- Hydrogeology data
- More detail on surface water quality concerns
- Stream morphology assessments
- Abandoned mine inventory and assessment
- Specific data on state highway impacts
- Details on jurisdiction, ownership, and land use
- Historical uses, traditional values, local knowledge
- Recognition of rapid changes in uses of land and water
- Recognition of regulation changes
- Ongoing NMED assessments

Potential sources for this information include:

- Ongoing USFS inventory and assessment of national forest and recreational roads
- NMED TMDL background monitoring data and other studies
- New Mexico Office of the Natural Resources Trustee
- U.S. Geological Survey (USGS) Background Characterization Study
- U.S. Fish & Wildlife Service (USFWS) studies
- New Mexico Department of Fish & Game (NMDGF) studies
- New Mexico State Highway & Transportation Department (NMSHTD) information
- Taos County Planning Department
- New Mexico State Historical Archives
- Amigos Bravos library
- Personal libraries and archives of watershed residents
- Oral histories and local knowledge
- Final Taos Regional Water Plan

Water Quality Problems

The water quality impairments listed on the table are labeled “potential,” because in some cases the jury is still out. But everything listed is an issue that has been identified as an area of concern by one party or another and worth at least further investigation and monitoring, if not a full-scale restoration project. And everything listed contributes in some way to overall watershed health and function in terms of water quality and/or water yield. In a few cases the “issue” is nothing more than an educational potential, but that is just as important to long-term non-point source mitigation and water quality protection as on-the-ground restoration projects.

A general list of water quality issues in the watershed, more-or-less from upstream to downstream, includes:

- Sediment and nutrient contamination from livestock and wildlife grazing
- Nutrient contamination from poorly designed and poorly regulated septic systems and increased growth
- Wetlands, riparian, and stream impacts
- Sediment erosion from ATV use

- Sediment erosion from road cuts along State Highway 518, FS Rd 437, and other paved roads



Figure 9: Ranchos de Taos

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IV E. Water Quality Goals

Desired Conditions and Uses

One priority water quality goal is to implement the proposed TMDLs for the Ranchos de Taos throughout the watershed.

As the WRAS continues to evolve through an iterative, adaptive process, the Ranchos de Taos Neighborhood Association partners and working groups will determine specific desired uses and the conditions required to reach those uses for each subwatershed and/or on a project-by-project basis. This process will involve the land management and regulatory agencies, but will also involve watershed residents and other stakeholders through outreach programs. To help determine desired uses and conditions we will solicit local perspectives, values, and priorities through local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups. The scoping, designing, and implementation of projects will obviously incorporate all available information and will also utilize the best science available.

Monitoring and Assessments

To measure whether we have attained the desired uses and conditions, it will be important to establish clear water quality goals and monitoring protocols for each restoration project. Along with conventional quantitative water quality measurements, in places we will also utilize the Rosgen Stream Classification System for general assessments of ecological needs as appropriate.

Whenever possible, we will utilize all available regulatory-related water quality monitoring data, both as existing baseline data and to monitor ongoing progress. Some of the baseline data will come from the TMDL background monitoring and other previous water quality studies and reports. However, all up-to-date and available data will be utilized. Particular projects may be able to piggyback on the monitoring and data from surrounding WRASes. In addition to existing partners, we may find need to hire professional consultants to help design and implement water quality monitoring and other assessments.

Water quality monitoring and other assessments, before, during, and after each project, can double as an excellent opportunity for hands-on education. This approach opens many opportunities for expanded outreach, solicits in-kind contributions to help get the work done, and provides solid experiential education for the participants.

Project and Process Evaluation

In addition to physical monitoring and assessments, it is just as important to monitor and evaluate the process of communication, collaborative planning, and project implementation on an ongoing basis. The Ranchos de Taos Neighborhood Association will actively solicit and incorporate recommendations and input from all project partners and local residents early in the planning process. During and after every project, we will

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actively solicit and incorporate follow-up recommendations and input as part of an iterative adaptive management process. This is important for better project implementation, but also for improving communications, strengthening collaborative partnerships, and working toward building a broad and strong watershed-wide community.

V E. Action Plan

Still a Collaborative and Comprehensive Approach

A WRAS, by definition and intent, is a comprehensive approach that includes technical, educational, and financial components of watershed restoration. A Watershed Group may not take the lead on every project, but a main function will be to coordinate all the relevant stakeholders, information, technical resources, public educational activities, and finances for watershed restoration projects. With all projects, the Watershed Group will help coordinate compliance with all laws, regulations, and permits, particularly the legal requirements of NEPA and other federal laws for any actions on federal lands. This coordinated approach will help facilitate communication, networking, and planning among the many agency and private stakeholders, even beyond the scope of the WRAS, and will help avoid duplication of efforts.

The project matrix in Chapter III includes a preliminary list of key stakeholders and potential partners for each potential project area. As part of the project coordination, the Watershed Group/Association will continue to identify and involve core stakeholders for each water quality issue or restoration project, incorporating existing mandates and agreements between agencies and other entities as much as possible. As with monitoring and assessments, involving and coordinating local schools and educational and non-profit conservation organizations in restoration projects will be an integral part of our effort. Again, it is an excellent opportunity to both enlist volunteers and facilitate hands-on watershed and natural resource education.

The Watershed Group/Association will always keep in mind the fact that this WRAS is a non-regulatory, voluntary approach based not on legal obligations but on the strength of collegial collaboration, open communication, and building a watershed community. It is important for us to keep that spirit in all our restoration planning and projects. Without a formal legal framework, however, we will structure strategic partnerships and stipulate expectations between agencies and other stakeholders through formal Memoranda of Understanding (MOUs) or Memoranda of Agreement (MOAs) to insure better follow through on restoration plans and projects. Some general MOUs and MOAs already exist between federal and state agencies.

Priorities and Timetable

Looking at the general list of water quality issues and potential problems and the potential restoration needs and projects in the project matrix in Chapter III, it is obvious that there is no shortage of restoration work in this watershed. The trick will be to

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strategically prioritize the projects in a way that makes sense and is achievable. We will use several criteria for determining priorities and structuring projects:

- *Consistency with existing management plans.* This might include, for instance, USFS forest thinning projects, erosion mitigation projects, grazing program modifications, or a recreation travel plan. The Taos County Comprehensive Plan calls for such things as better land use planning, protecting local water and land, preserving open space, and developing economic opportunities, all of which could well be consistent with restoration projects.
- *Fit within existing MOUs and MOAs.* Several state and federal agencies already have formal agreements and relationships through MOUs and MOAs that deal with particular issues.
- *Reflect local community concerns and priorities*
- *Potential as experimental pilot projects to test the feasibility of certain treatments.* Before taking on a larger project with uncertain results, we will test certain treatments on a smaller scale first.
- *Potential as demonstration pilot projects to generate public interest, involvement, and support.*
- *Potential for building or strengthening partnerships.* Along the lines of the previous item, building and strengthening relationships among watershed residents and stakeholders is a high priority to keep the WRAS process moving forward.
- *Availability of funding.* All projects will of course be contingent on funding.

The project matrix in Chapter III outlines water quality issues and potential restoration projects on a site-by-site basis. In general, the Ranchos de Taos Neighborhood Association will address identified quality issues (from the list under “Water Quality Problems” in Chapter III) in the following ways:

- *Sediment and nutrient contamination from excessive livestock and wildlife grazing.* Conduct impact assessment and mitigation, including the USFS’s ongoing implementation of rest-rotation grazing management and erosions control.
- *Nutrient contamination from poorly designed and poorly regulated septic systems.* Continue the process of citizen monitoring, public education, and regulatory enforcement of Taos County and NMED regulations.
- *Wetlands, riparian, and stream impacts from dense and poorly regulated development.* Continue the process of public education and citizen monitoring.
- *Sediment erosion from excessive ATV use.*
- *Sediment erosion from road cuts and other paved roads.* Working with the New Mexico State Highway & Transportation Department and NMED, conduct an impact assessment and design mitigation projects.
- *Habitat loss due to degraded and unnaturally channelized stream course.* Conduct stream morphology assessments and enhancements based on Dave Rosgen’s Stream Classification System.

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**Greater World Community NM WRAS
Water Restoration Action Strategy
&
Non Point Source Abatement Plan**



DRAFT – July 22, 2006

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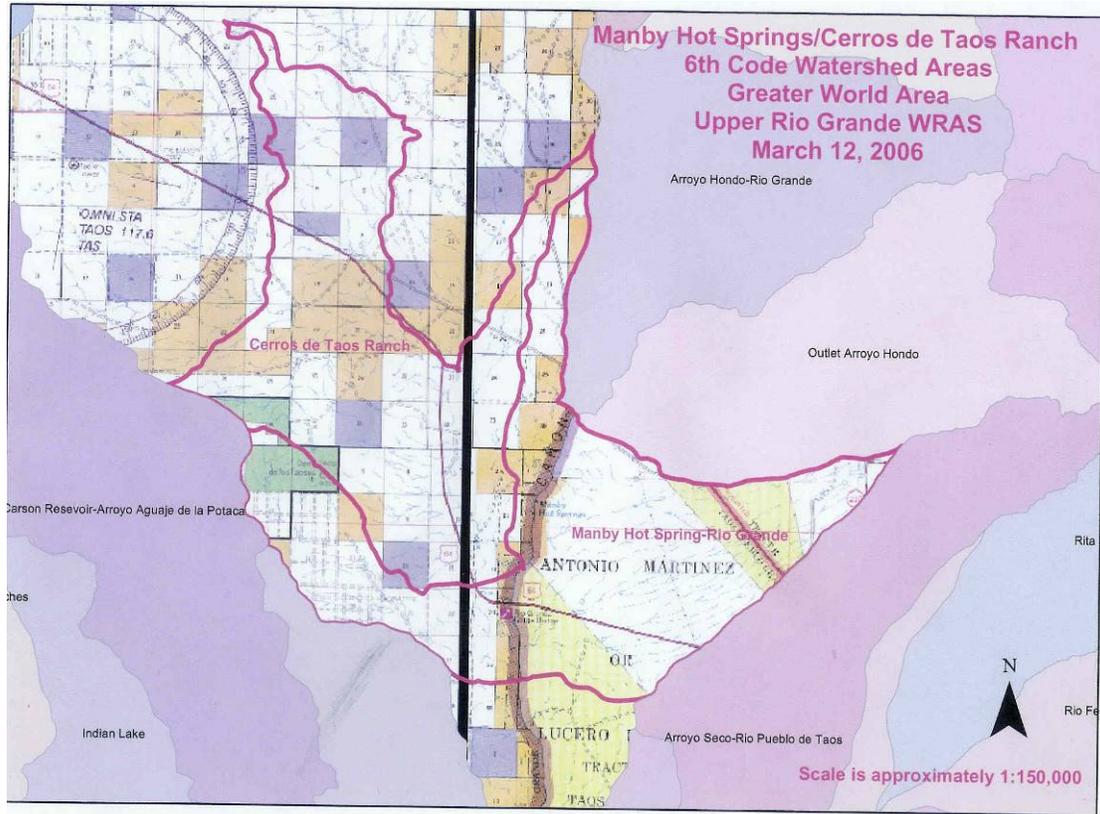


Figure 10: Greater World Community Watershed Map



Figure 11: West Rim Rio Grande Gorge

I F. Introduction: What is a WRAS?

A Collaborative and Comprehensive Approach

A Watershed Restoration Action Strategy, or WRAS, is a non-regulatory, voluntary approach to addressing nonpoint source impacts to water quality. It is based not on legal obligations but on a desire to restore watershed health and water quality through the strength of collegial collaboration, open communication, and building a watershed community among local residents, agencies, and other stakeholders. It is a general blueprint for a comprehensive, watershed-wide restoration program, one small project at a time.

This WRAS, like a community, is an evolving process. It will continue to be an organic document with the hope of remaining as fresh, useful, and relevant as possible and keeping the momentum rolling. This document represents a starting point providing a basic framework and identifying priority areas, but we will add details and layers of information as we proceed, possibly including Geographic Information System (GIS) data and maps. We hope that this document will also serve as a general watershed and resource guide for any person or entity who would like to learn more about the Greater World Community or address water-related issues within the watershed.

The Greater World Community's mission is to restore the watershed to support and be safe for a variety of uses and enhance the understanding about the area waters through information and education. We pursue that mission through these four goals:

1. Determine pollutants, their sources and effects, and communicate the information to citizens.
2. Maintain and improve surface and groundwater quality.
3. Bring citizens together to restore, protect, and fully utilize the Greater World Community.
4. Educate and inform users and citizens about the area and watershed stewardship.

Because of the regulatory history, agencies, and processes involved, there will be an unavoidable layer of technical jargon and acronyms and abbreviations in this document. We will try to make it as reader-friendly as possible with explanations, definitions, and glossaries throughout.

Clean Water Act, TMDLs, Nonpoint Source, and Point Source Pollution

The 1972 federal Clean Water Act (CWA) is the basis of most national and state water quality standards and regulations. The CWA protects water quality in all streams, lakes, and other surface waters of the U.S. It also established the goals of eliminating the discharge of all pollutants and cleaning up all surface waters to support fish, wildlife, and recreation by 1985. Thirty years later we still haven't reached those goals, but they are the intention and the ultimate aim of the regulatory processes described below and of this WRAS, all of which grew out of the CWA.

The TMDL, or Total Maximum Daily Load, is one tool that lies at the core of the WRAS, though we hope to go well beyond its limited scope in our restoration plans. As part of the federal Clean Water Act, TMDLs set limits to particular substances identified as pollutants for any given stretch of river.

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Even for these few listed materials, the TMDL unfortunately does not include legal mechanisms for addressing “nonpoint source” impacts, which comprise up to 50% of water quality problems nationwide. Nonpoint source pollution, according to the Environmental Protection Agency (EPA), “occurs when water runs over land or through the ground, picks up pollutants, and deposits them in surface waters or introduces them into groundwater.” It comes from scattered, often indistinct sources such as abandoned mines or erosion from denuded hillsides. Hence the need for a voluntary group and this WRAS.

Point source discharges, on the other hand, are regulated by EPA under National Pollutant Discharge Elimination System (NPDES) permits and must meet TMDL limits. Point sources include any discharge that flows into a receiving body out of the end of a pipe or from a discrete source, such as runoff or seepage from an industrial site.

II F. Public Outreach

Past Public Outreach Efforts

The Greater World Community (GWC) recognizes that public outreach and education are just as important to long-term nonpoint source mitigation and water quality protection as on-the-ground restoration projects. To that end, the GWC has been actively conducting outreach and education on water quality and watershed issues throughout the watershed. With the planning and implementation of projects outlined in this WRAS, we will continue and expand that process.

Key ingredients for successful public outreach include 1) clearly identifying what’s in this for local residents and stakeholders, 2) keeping the process and the information clear, jargon-free, and accessible to a wide diversity of the general public, and 3) striving for maximum buy-in through relationships, projects, and solutions that are collaborative and collegial.

It is an unending process, but the Greater World Community will continue to address the public interest in terms of important issues related to water quality, including drinking water, agriculture, recreation, aesthetics, property values, and general quality of life.

Ongoing and Future Public Outreach

The Greater World Community continues to solicit input and conduct outreach, and will expand that process through the implementation of projects outlined in this WRAS, through a variety of organizations and venues, including:

- Members of the Greater World Community (local residents, non-profit organizations, local, state, and federal agencies, other stakeholders)
- Community constituents (ranchers, part-time residents, traditional and sustainable resource communities)
- Local businesses
- ongoing TMDL development under the New Mexico Environment Department (NMED)

In particular, the Watershed Group will also involve watershed residents and other stakeholders, along with land management and regulatory agencies, in the decision making process through a

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combination of local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups to help determine local water quality perspectives, values, and restoration priorities using sound scientific and technical expertise. We will also continue to take advantage of a variety of media and approaches for effective and creative public outreach and education, including oral histories, publications, and public events.

Details on coordinating cross-agency and public involvement are found in the Action Plan for this WRAS in Chapter V.



Figure 12: Greater World Community Subdivision

III F. Watershed Inventory and Assessment

Watershed Description

WRAS Project Matrix Description

The project matrix is the core of this WRAS, providing a watershed-wide overview of 1) potential water quality issues and potential impairments, 2) potential restoration needs and projects, and 3) key stakeholders and potential partners. We recognize the fact that this table is not a detailed and exacting as it might be, but given the physical, historical, cultural, jurisdictional, and water quality complexities of this particular watershed, it is the most comprehensive water quality overview and watershed restoration blueprint to date. In some cases the table provides specific direction; at the very least it is a springboard from which to move forward to more completely identify potential water quality problems and restoration projects.

Information Needs and Sources

In the spirit of approaching this WRAS as a living, working document, the Greater World Community and its partners will continue to build on the overview presented in the table with additional layers of information and detail as we move forward with specific restoration projects. Some of the information we will continue to gather and add to the WRAS process includes:

- Additional maps, possibly including layered GIS maps
- Specifics on soils and vegetation
- Hydrogeology data
- More detail on surface water quality concerns
- Stream morphology assessments
- Abandoned mine inventory and assessment
- Specific data on state highway impacts
- Details on jurisdiction, ownership, and land use
- Historical uses, traditional values, local knowledge
- Recognition of rapid changes in uses of land and water
- Recognition of regulation changes

Potential sources for this information include:

- NMED TMDL background monitoring data and other studies
- New Mexico Office of the Natural Resources Trustee
- U.S. Geological Survey (USGS) Background Characterization Study
- U.S. Fish & Wildlife Service (USFWS) studies
- New Mexico Department of Fish & Game (NMDGF) studies
- New Mexico State Highway & Transportation Department (NMSHTD) information
- Taos County Planning Department
- New Mexico State Historical Archives
- Amigos Bravos library
- Personal libraries and archives of watershed residents
- Oral histories and local knowledge

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Figure 13: Sustainable Energy and Water Earthship Technology Homes

Water Quality Problems

The water quality impairments listed on the table are labeled “potential,” because in some cases the jury is still out. But everything listed is an issue that has been identified as an area of concern by one party or another and worth at least further investigation and monitoring, if not a full-scale restoration project. And everything listed contributes in some way to overall watershed health and function in terms of water quality and/or water yield. In a few cases the “issue” is nothing more than an educational potential, but that is just as important to long-term nonpoint source mitigation and water quality protection as on-the-ground restoration projects.

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WRAS Project Matrix

Location	TMDL	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
Zac and Nicole's lot		rainstorm produced significant erosion damage to the arroyo and is starting to endanger the house.	arroyo stabilization, irrigation water catchment	Zac and Nicole stakeholders GWLUA, TSWCD, BLM partners
GWLUA "Land Dam" by the well		Spadefoot toad protection	protect the toads at the land dam when it floods	GWLUA members stakeholders, NMED potential partner

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IV F. Water Quality Goals

Desired Conditions and Uses

As the WRAS continues to evolve through an iterative, adaptive process, the Greater World Community partners and working groups will determine specific desired uses and the conditions required to reach those uses for each subwatershed and/or on a project-by-project basis. This process will involve the land management and regulatory agencies, but will also involve watershed residents and other stakeholder through an extensive outreach program. To help determine desired uses and conditions we will solicit local perspectives, values, and priorities through local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups. The scoping, designing, and implementation of projects will obviously incorporate all available information and will also utilize the best science available.

Monitoring and Assessments

To measure whether we have attained the desired uses and conditions, it will be important to establish clear water quality goals and monitoring protocols for each restoration project. Along with conventional quantitative water quality measurements, in places we will also utilize the Rosgen Stream Classification System for general assessments of stream health and fishery habitat, as well as other qualitative ecological assessments as appropriate.

Whenever possible, we will utilize all available regulatory-related water quality monitoring data, both as existing baseline data and to monitor ongoing progress. Some of the baseline data will come from the draft TMDL background monitoring and other previous water quality studies and reports. However, all up-to-date and available data will be utilized. Particular projects may be able to piggyback on the monitoring and data from the ongoing USGS Background Characterization Study. In addition to existing partners, we may find need to hire professional consultants to help design and implement water quality monitoring and other assessments.

Water quality monitoring and other assessments, before, during, and after each project, can double as an excellent opportunity for hands-on education. This approach opens many opportunities for expanded outreach, solicits in-kind contributions to help get the work done, and provides solid experiential education for the participants.

Project and Process Evaluation

In addition to physical monitoring and assessments, it is just as important to monitor and evaluate the process of communication, collaborative planning, and project implementation on an ongoing basis. The Greater World Community will actively solicit and

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incorporate recommendations and input from all project partners and local residents early in the planning process. During and after every project, we will actively solicit and incorporate follow-up recommendations and input as part of an iterative adaptive management process. This is important for better project implementation, but also for improving communications, strengthening collaborative partnerships, and working toward building a broad and strong watershed-wide community.

V F. Action Plan

Still a Collaborative and Comprehensive Approach

A WRAS, by definition and intent, is a comprehensive approach that includes technical, educational, and financial components of watershed restoration. A Watershed Group may not take the lead on every project, but a main function will be to coordinate all the relevant stakeholders, information, technical resources, public educational activities, and finances for watershed restoration projects. With all projects, the Greater World Community will help coordinate compliance with all laws, regulations, and permits, particularly the legal requirements of NEPA and other federal laws for any actions on federal lands. This coordinated approach will help facilitate communication, networking, and planning among the many agency and private stakeholders, even beyond the scope of the WRAS, and will help avoid duplication of efforts.

The project matrix in Chapter III includes a preliminary list of key stakeholders and potential partners for each potential project area. As part of the project coordination, the Greater World Community will continue to identify and involve core stakeholders for each water quality issue or restoration project, incorporating existing mandates and agreements between agencies and other entities as much as possible. As with monitoring and assessments, involving and coordinating local schools and educational and non-profit conservation organizations in restoration projects will be an integral part of our effort. Again, it is an excellent opportunity to both enlist volunteers and facilitate hands-on watershed and natural resource education.

The Greater World Community will always keep in mind the fact that this WRAS is a non-regulatory, voluntary approach based not on legal obligations but on the strength of collegial collaboration, open communication, and building a watershed community. It is important for us to keep that spirit in all our restoration planning and projects. Without a formal legal framework, however, we will structure strategic partnerships and stipulate expectations between agencies and other stakeholders through formal Memoranda of Understanding (MOUs) or Memoranda of Agreement (MOAs) to insure better follow through on restoration plans and projects. Some general MOUs and MOAs already exist between federal and state agencies.

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Priorities and Timetable

Looking at the general list of water quality issues and potential problems and the potential restoration needs and projects in the project matrix in Chapter III, it is obvious that there is no shortage of restoration work in this watershed. The trick will be to strategically prioritize the projects in a way that makes sense and is achievable. We will use several criteria for determining priorities and structuring projects:

- *Consistency with existing management plans.* This might include the Taos County Comprehensive Plan that calls for such things as better land use planning, protecting local water and land, preserving open space, and developing economic opportunities, all of which could well be consistent with restoration projects.
- *Fit within existing MOUs and MOAs.* Several state and federal agencies already have formal agreements and relationships through MOUs and MOAs that deal with particular issues.
- *Reflect local community concerns and priorities*
- *Potential as experimental pilot projects to test the feasibility of certain treatments.* Before taking on a larger project with uncertain results, we will test certain treatments on a smaller scale first.
- *Potential as demonstration pilot projects to generate public interest, involvement, and support.*
- *Potential for building or strengthening partnerships.* Along the lines of the previous item, building and strengthening relationships among watershed residents and stakeholders is a high priority to keep the WRAS process moving forward.
- *Availability of funding.* All projects will of course be contingent on funding.

The project matrix in Chapter III outlines water quality issues and potential restoration projects on a site-by-site basis. In general, the Watershed Group will address identified quality issues (from the list under “Water Quality Problems” in Chapter III) in the following ways:

- *Sediment erosion from lack of vegetation and unprotected arroyos.* Culvert projects, roadbed and erosion stabilization.
- *Habitat loss due to degraded and unnaturally channelized stream course.* Conduct stream morphology assessments and enhancements based on Dave Rosgen’s Stream Classification System.

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Other Resources

Center for Watershed Protection website: www.cwp.org.

Clean Water Network website: www.cwn.org.

EPA Clean Water Act website: www.epa.gov/region5/water/cwa.htm.

EPA Watershed Information Network website: www.epa.gov/win.

Rio Colorado Reclamation Committee (local Superfund Technical Assistance Grant committee) website: www.rcrc.nm.org.

USFS public participation process for developing off-road vehicle travel plan: website: www.fs.fed.us/r2/psicc/sal/fourmile.htm.

USGS current Red River Background Characterization Study information: website:
wwwbrr.cr.usgs.gov/projects/GWC_chemtherm/questa.htm.

Watershed Support Program website: www.4sos.org.

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Glossary of Terms, Acronyms & Abbreviations

319 program – nonpoint source pollution prevention program under the Clean Water Act that provides grants and other assistance to local organizations and governments,

404 permit – required under the Clean Water Act before dredging or filling stream channels or wetlands, administered by the U.S. Army Corps of Engineers.

ARD – Acid Rock Drainage generated by unreclaimed mine waste rock dumps and tailings.

BLM – Bureau of Land Management.

BMPs – Best Management Practices to reduce nonpoint source impacts.

CFRP – Collaborative Forest Restoration Program, which provides federal funding for community-based forest thinning and stewardship and small diameter wood marketing.

COE – U.S. Army Corps of Engineers.

CWA – Commonly known as the Clean Water Act, the 1972 Federal Water Pollution Control Act protects water quality in all streams, lakes and other surface waters of the U.S., with a goal of eliminating the discharge of all pollutants.

EPA – U.S. Environmental Protection Agency.

GIS – Geographical Information System is a data-based computer mapping technology that can generate multiple layers of different kinds of map information.

GWQB – Ground Water Quality Bureau of the New Mexico Environment Department.

MMD – Mining and Minerals Division of the New Mexico Energy, Minerals and Natural Resources Department.

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MOA – Memorandum of Agreement.

MOU – Memorandum of Understanding.

NEPA – National Environmental Policy Act, which mandates an assessment of potential environmental consequences of management actions on federal public lands, possibly including Environmental Assessments or Environmental Impact Statements.

NGO – Non-Governmental Organization, generally a non-profit community or environmental organization.

NMDGF – New Mexico Department of Game and Fish.

NMED – New Mexico Environment Department.

NMEMNRD – New Mexico Energy, Minerals & Natural Resources Department.

NMMA – New Mexico Mining Act, which requires mine permitting and Closeout and Reclamation Plans.

NMFD – New Mexico Forestry Division.

NMDOT – New Mexico Department of Transportation

NMWQA – New Mexico Water Quality Act, which mandates compliance with New Mexico Water Quality Standards.

NMWTB - New Mexico Water Trust Board.

Nonpoint Source – scattered, often indistinct pollution sources, such as abandoned mines, agricultural runoff, erosion from denuded hillsides or streambanks, fire scars, overgrazing or overcutting, parking lots, recreational or paved roads, etc.

NPDES – National Pollutant Discharge Elimination System Permit under the Clean Water Act requires compliance with water quality standards and TMDLs for point source discharges to surface water, administered by the Environmental Protection Agency.

NPS - **Nonpoint** Source.

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NRCS – U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service).

OSE – New Mexico Office of the State Engineer

Point Source – Any polluted affluent that flows into the river out of the end of a discharge pipe or from a distinct single source, such as runoff or seepage from an industrial site, usually regulated under NPDES permits.

RI/FS – Remedial Investigation and Feasibility Study is a preliminary step in the Superfund cleanup process.

RMYC – Rocky Mountain Youth Corps

Superfund – money and process administered by the Environmental Protection Agency to clean up toxic contamination that threatens environmental and human health.

SWQB – Surface Water Quality Bureau

TMDL – Total Maximum Daily Loads set limits to particular substances identified as pollutants for any given stretch of river.

TSWCD – Taos Soil and Water Conservation District.

USDA – U.S. Department of Agriculture.

USDOI – U.S. Department of Interior.

USFS – U.S. Forest Service.

USFWS – U.S. Fish and Wildlife Service.

USGS - U.S. Geological Survey.

Watershed – the entire area of land, from the headwaters to the mouth of a drainage, that flows into a stream or water body.

Wildland-Urban Interface - federal program to reduce forest fire hazard on public lands around populated areas.

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WRAS – Watershed Restoration Action Strategy is a non-regulatory, voluntary approach to addressing nonpoint source impacts to water quality.

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Atencio	Ernie		Taos Land Trust	PO Box 537 Arroyo Hondo, NM 87513	(505) 776-1882		
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Draney	Scott		NM Game & Fish	PO Box 2765 Ranchos de Taos, NM 87557	(505) 751-4738		sdraney@state.nm.us
Driskell	Russ		Rio Fernando Fire Department	HC 71 Box 91 L Taos, NM 87571	(505) 758-3088		
Foster	Matt		Planner, Town of Taos	400 Camino de la Placita Taos, NM 87571			
Frank	Larry			PO Box 290 Arroyo Hondo, NM 87531	(505) 776-2281		
Gaffney	Michael		Rocky Mountain Youth Corp.	PO Box 1960 Ranchos de Taos, NM 87557	(505) 751-1426		
Gallegos	Phil		NMDOT	Box 4127 Coronado Station Santa Fe, NM 87501	(505) 827-9532		
Garcia	Luis			Box 1356 Ranchos de Taos, NM 87557	(505) 758-9365		
Gardiner	Ron			PO Box 1008 Questa, NM 87556	(505) 586-0700		gardiner@laplaza.org
Gervison	Ron		TSWCD	PO Box 371 Arroyo Seco, NM 87514	(505) 776-3921		
Gonzales	Josephine			HC Box 10216 Ranchos de Taos, NM 87557	(505) 758-1689		talpalibrary@wm.connect.com
Gonzales	Telesfor		El Prado Water & Sanitation	P.O. Box 1110 El Prado, NM 87529	(505) 751-3335		

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Last Name	First Name	WRAS Comm. Member	Title/Affiliation	Address	Telephone Number	Fax Number	E-Mail Address
Gustina	Greg		BLM	226 Cruz Alta Taos, NM 87571	(505) 751-4707		ggustina@nm.blm.gov
Harris	Steve		Rio Grande Restoration	Box 3-C Pilar, NM 87531			
Herskovits	Simeon		Western Environmental Law Center	P.O. Box 1507 Taos, Nm 87571	(505) 751-0351		herskovits@westernlaw.org
Kanter	Deb		Carson National Forest	208 Cruz Alta Taos, NM 87571	(505) 758-6251		
Kenin	Steve		Developer	PO Box 1377 Taos, NM 87571			
King	Neal		Mayor, Village of Taos Ski Valley	P.O. Box 100 Taos Ski Valley, NM 87525	(505) 776-8220		
Lay	Amy		Earthship Bioteecture	PO Box 1041 Taos, NM 87571	(505) 751-0462		amyklay@earthship.org
Lister	Judy		Native Plant Society	PO Box 568 Arroyo Seco, NM 87514			glister@newmex.com
Manzanares	David		Northern RG RC&D	424 G Riverside Drive Espanola, NM 87532	(505) 753-3508		
Martinez	Albino		Taos County Board of Realtors	6005 NDCBU Taos, NM 87571	(505) 751-0013		amartinez@taosnet.com fishrman@taosnet.com
Martinez	Andy			Box 2444 Taos, NM 87571	(505) 667-3888		
Martinez	Gayle		Taos County Chamber of Commerce	P.O. Drawer I Taos, NM 87571	(505) 737-2930		gmart@taoschamber.com
Martinez	Erminio			Box 1831 Taos, NM 87571	(505) 758-4030		
Martinez	Palemon A.		Taos Valley Acequia Association	P.O. Box X Valdez, NM 87580	(505) 776-8269		palemonmartinez@earthlink.net

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Maxwell	William		Taos News				
Medina	Cipriano		Gravel Mining	P.O. Box 345 Taos, NM 87571	(505) 758-4064		
Miera	John		Camino Real Ranger District	PO Box 68 Penasco, NM 87553	(505) 587-2255		
Miller	Greg		Carson National Forest	208 Cruz Alta Taos, NM 87571	(505) 758-6251		gmler@fs.fed.us
Mobet	Tim			Box 686 Ranchos de Taos, NM 87557	(505) 751-1223		
Mondragon	Bennie			PO Box 18 Ranchos de Taos, NM 87557	(505) 770-7237		
Oatman	Frank			Loma del Cielo 70 Tres Lomas Road Arroyo Hondo, NM 87513	(505) 770-3019		foatman@together.net
Ogburn	Jeff		Taos Pueblo	PO Box 1846 Taos, NM 87571	(505) 751-4601		jogburn@taospueblo.com
Otis	John		Taos Canyon N.A.	7001 NDCBU Taos, NM 87571	(505) 758-2301		
Pacheco	Manuel Rudy			PO Box 852 Taos, NM 87571	(505) 758-3168		
Painter	John		El Prado Water and Sanitation District	P.O. Box 1110 El Prado, NM 87529	(505) 751-3335, 770-7751 cell		joyride@laplaza.org
Palacios	Elizabeth C.		Taos Community Foundation	PO Box 1925 Taos, NM 87571	(505) 737-9300		ecrittenden@taoscf.org
Parker	James		Rio Fernando Fire Dept.	Rt. 1 Box 32 Taos, NM 87571	(505) 758-1937		

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Passaglia	Mary		Rocky Mountain Youth Corp.	PO Box 1960 Ranchos de Taos, NM 87557	(505) 751-1426		
Pasteris	Al		New Mexico Environment Department, Surface Water Quality Bureau	P.O. Box 26110 Santa Fe, NM 87502	(505) 827-5742		
Peralta	Ignacio		Carson National Forest	208 Cruz Alta Taos, NM 87571	(505) 758-6344		iperalta@fs.fed.us
Potter	Michele			5429 NDCBU Taos, NM 87571	(505) 758-8013		
Quintana	Joe		River Runners/Native Sons	P.O. Box 1258 Taos, NM 87571	(505) 758-9342		
Ragland	Debbie		UNM	1490 Weimer Road Taos, NM 87571	(505)		
Rael	Dan		U.S. Forest Service Carson National Forest	208 Cruz Alta Taos, NM 87571	(505) 758-6200		drael@fs.fed.us
Reyes	Luis		Kit Carson Electric	118 Cruz Alta Rd. Taos, NM 87571	(505) 758-2258		
Reynolds	Michael		Greater World Community	PO Box 1041 Taos, NM 87571	(505) 751-0462		biotecture@earthship.org
Romero	Julian		Tienditas Saw Mill	Box 1063 Taos, NM 87571	(505) 758-8019		
Romero	Rosemary		Rosemary Romero Consulting	1350 San Juan Drive Santa Fe, NM 87505	(505) 982-9805		rosemary1350@cs.com
Romero	Ruben		Governor, Pueblo of Taos	P.O. Box 1846 Taos, NM 87571	(505) 758-9593		
Russell	Matt		State Forestry	HC 75 Box 100 Chama, NM 87520	(505) 588-7831		
Sanborn	Erin			HCR 74 Box 23472 El Prado, NM 87529	(505) 770-2991		Creative_partnerships@yahoo.com

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Santistevan	Miguel		NM Acequia Association	908 Sol Feliz Taos, NM 87571	(505) 751-7455		miguels@newmexico.com
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Shields	Brian		Executive Director, Amigos Bravos	P.O. Box 238 Taos, NM 87571	(505) 758-3874		bshields@amigosbravos.org
Straebel	Rob		Village Administrator, Village of Taos Ski Valley	P.O. Box 100 Taos Ski Valley, NM 87525	(505) 776-8220		
Sullivan	Yesca		Middle Rio Grande Watershed	PO Box 277 Embudo, NM 87531			
Tafoya	Max			430 Estes Road Ranchos de Taos, NM 87557	(505) 758-9411		
Tafoya	Tommy			27 Archuleta Road Ranchos de Taos, NM 87557	(505) 770-5804		
Tibedeaux	Ron		Questa Ranger District US Forest Service	PO Box 110 Questa, NM 87556	(505) 586-0520		
Torres	Joe			PO Box 417 Arroyo Hondo, NM 87514	(505) 776-1103		
Trujillo	Stephen		Taos County, TVAA	HC 68 Box 30B Taos, NM 87571	758-4500		strujillo@epeoples.com
Trujillo	Jose Leon			PO Box 72 San Cristobal, NM 87564	(505) 776-5122		
Trujillo	Delbert		NMED	PO Box 1160 Santa Fe, NM 87501	(505) 827-2867		
Valerio Healy	Trudy		Water Trust Board	PO Box 767 Taos, NM 87571	(505) 776-1651		milagro@laplaza.org
Vasquez	Enriquita			PO Box 43 San Cristobal, NM 87564			

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Velarde	Linda			PO Box 386 Taos, NM 87571	(505) 776-0303		
Vigil	Allen			105 Albright, Suite C Taos, NM 87571	505-737-6440, 505-737-6449		allenv@taosnet.com
Vigil	Frank		Northern NM Stockman's Association	213 Paseo de Canon Ranchos de Taos, NM 87571	(505) 758-5245		vigil_francisco@hotmail.com
Vigil	Eloy		Acequia Association	52 Camino del Rio Pilar, NM 87571			
Vigil	Gil			Box 142 Ranchos de Taos, NM 87571	(505) 770-4447		
Vigil	Peter		Taos Soil & Water Conservation District	P.O. Box 2787 Ranchos de Taos, NM 87557	(505) 751-0584		TSWCD@newmex.com
Vigil	Gary		Pilar Community Association	Pilar Route Box 70 Embudo, NM 87531	(505) 737-9339		
Vigil	Demecio			PO Box 1635 Taos, NM 87571			
Vigil	Dolores		Northside Acequia/Pilar	Box 10 B Pilar, NM 87531	(505) 758-4176		
Villalobos	Deborah		Las Colonias	PO Box 1135 Taos, NM 87571			
Vincent	Lawrence			PO Box 314 San Cristobal, NM 87564	(505) 776-8759		
Williams	Valerie		BLM	226 Cruz Alta Taos, NM 87571	(505) 751-4716		
Yeargin	Jerry			HC 71 Box 101 Taos, NM 87571	(505) 758-8457		

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